

PT7 cuts costs

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# Computer Weekly

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## Cluff slams the new privacy Bill

by George Black  
CHANGES to the Data Protection Bill, reintroduced to the House of Lords last week, have failed to silence its critics. The main amendment is the government's concession to allow "common files", such as payroll and accounts, to be exempt from registration requirements.

But Ted Cluff, secretary-general of the Institute of Data Processing Management, said: "The new Bill is no better than its predecessor, so far as we are concerned. We don't believe it will work. The government is simply not dedicated to avoiding the invasion of privacy."

The Bill gets its second reading this week in the Lords - where it is unlikely to get through the Commons before the summer recess. The timetable indicates a third Commons reading in late autumn.

In the meantime the IDPM is planning to re-launch its "alternative Bill" suggested before the election. It will hold talks with the Local Authorities' Management Services and Computer Committee, Lamsac, on re-drafting the legislation as part of a publicity campaign against the government Bill.

"We don't think we have any chance of changing the government's mind now, but we'd like to do it," said Cluff.

Home Office Minister of State David Waddington said the changes would make the Bill easier to operate.

"The Bill is a measure designed to enable the UK to ratify the Council of Europe Convention on data protection and to offer reassurance that personal information held on computers will not be mis-

used," Waddington added.

He claimed the registrar's workload had been eased to enable him to devote more resources to overseeing the law.

But the National Council for Civil Liberties was unconvinced. Its legal officer, Marie Storrton, said they were disappointed that after constructive suggestions from a wide range of bodies the government had made so few amendments.

"It won't please either data subjects or data users," she said.

Computing Services Association director-general Doug Byelons, however, welcomed the amendments and said they wanted the Bill on the statute book quickly.

"We want a law which interferes with our members' business as little as possible and this will now enable us quickly to ratify the Convention," he said.



WADDINGTON... "Changes make Bill easier to operate."

## All-in-one device is seen to work

THE long-awaited Triemco 2000 all in one telephone data service device was demonstrated in Hong Kong on Monday. The device was shown by the makers Conic Group and electronic mail messages and voice communications between California and Hong Kong were demonstrated.

According to the chairman of the Conic Group mass production would begin in September and he expected sales of over 250 million in the next few years. Barbara Wheeler from the designers Stamford Research International was present but no mention was made of Trend Communications the joint company set up by ICL and Conic to market the device.

## Yes to Pascal

PASCAL compilers from ICL and the small software specialist Prospero Software have gone successfully through the British Standards Institution's new Pascal compiler validation service.

## Robots on move

MITSUBISHI has set up a new software company in Japan to develop systems to control robots. Capitalised at 30 million yen (about £750,000) it is seen as the first step in a long-term plan to export robots worldwide. The Mitsubishi empire already contains five other software enterprises.

## IBM addition

IBM has added its 3270 terminal communications protocol to its Displaywriter so the user can switch between word processing and interactive terminal work. Also new is a graphics package, Chartpak, which enables the Displaywriter to produce graphics.

## Spectrums are stolen

by George Black  
ARMED raiders got away with 3,000 Sinclair Spectrums from a North London warehouse on Sunday afternoon. The gang faked a street accident to lure guards away, held them up with guns, then packed the goods on to two trucks and vanished. The machines, which have a retail value of £390,000, belonged to one of Sinclair's biggest distributors, Prism. Managing director Bob Denton said they were all insured.

The incident began when a car

driven by a woman, with a male passenger, crashed into dustbins on the Cranford industrial estate, near Tottenham Lane, Hornsey. The estate manager and the security guard who were attracted to the scene were held up by three men. They had a hand-gun and a sawn-off shotgun. The car drove off at high speed.

The manager and guard were trapped in a van backed against a wall until their shouts later attracted a passer-by. The raiders loaded 300 cartons of micros.

## The Irish grow their services quickly

by Tom MacSweeney  
IRELAND's computer service companies are extremely valuable to the country's economy.

The computing services industry in Ireland has a turnover of £60 million and contributes to a higher proportion of the gross domestic product than in most other European countries.

The figures come from the first statistical survey of the industry carried out by the Irish Computer Services Association (ICSA).

The survey also revealed that membership of the association represents about 65% of the services industry and that 62% of members export an average of 28% of their total turnover.

The computing services industry in Ireland grew by 44% between 1981 and 1982 and is estimated to grow by at least 30% between 1982 and 1983.

It is estimated that the value of services will exceed the value of the computers by the end of this century.

Pat Chambers, president of the ICSA, said the figures underlined what the association had been saying about the growing importance of the services industry to the economy in Ireland.

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## Bureaux get a £5m incentive

by George Black  
BRITISH bureaux are to get £5 million from the government to help them develop a public database market.

Information Technology minister Kenneth Baker, announcing the plan at the Conference of Information Scientists in Oxford, said that one-third grants would be made available to bring forward data which helped industry and business.

"Continuing subsidies will not be possible," he emphasised. "Only activities that can demonstrate potential success in the marketplace will be eligible for funding."

But the success of the Department of Trade and Industry's (DTI) initiative depends heavily on the role to be played by British Telecom after its liberalisation next year, which remains in doubt.

BT could decide to move into

the supply of databases itself, through its Spectrum division, and it could even qualify for some of the DTI support.

But if BT opts to make life easier for bureaux by staying out and brings its charges down, then services could be brought on to the market two or three years earlier than would otherwise be possible.

This would give British firms a chance to get in ahead of their foreign competition.

So far most of the cash generated by databases has come from offering sophisticated tools to manage software problems, rather than the data itself.

And the profits have been scooped by big American bureaux and European rivals.

The huge investment in mounting services has needed too many

customers for UK firms to reach the take-off point. Only information with a specially high demand has been able to find a niche.

The government's latest injection could help those firms seeking to enter this risky area. Baric, the Barclay's Bank and ICL concern, is to put up a proposal to the DTI for a pharmaceutical database, according to its marketing manager Chris Gent.

"I still take the view that it will be the back half of the Eighties before database provision takes off," said Gent, "but we are in favour of the scheme because it gives us a chance of speeding things up."

Tony Helman, managing director of the City of London financial information bureau Datastream, said they would be looking carefully at the scheme to see what it could offer them.

■ Leader Comment - page 17.



BAKER... Data to help industry and business.

## Data General profits jump 23%

DATA General pushed quarterly profit up 23% on the same period last year with turnover staying flat at \$189 million. Return after tax was \$4.3 million, compared with \$3.5 million in 1982. Orders for Data General equipment were being delayed by senior managers, due to hesitation about the pace of economic recovery and tight control on capital budgets, said president Ed de Castro. He predicted a backlog of customers waiting for hardware would build up as soon as the situation changed.

## Agencies merge

TWO computer staff recruitment agencies have merged. D P Recruitment Services Limited of London has been acquired by MKA Search International (previously MKA Personnel) of Worcester. D P Recruitment covers a variety of computer-related job specifications and MKA Search international specialises in head-hunting for top jobs.

## Cirrus sold to US

ANOTHER UK CAD company has been sold to a US company. Manchester-based Cirrus Sigma has been bought by GenRad, the US test equipment manufacturer, for \$4.2 million. Cirrus will develop software for GenRad, and retains marketing rights to its HILO logic simulator, licensed from the Ministry of Defence.

## Victor's loss

VICTOR Technology, which supplies ACT with the Sirius 16-bit micro, has announced an unexpected second quarter loss. The company went public in March and has profits of \$309,000 of sales of \$55 million to the end of March.

## BT union ends its protest strike

by Nuala Moran  
THE government is pressing ahead with the Telecommunications Bill to sell 51% of British Telecom (BT), despite union action and the resignation of a BT director in protest over the bill.

Trade and Industry secretary, Cecil Parkinson, said last week that he intends to get the Bill on the statute book early next year. Following this the Office of Telecommunications (OfTel) will be set up to monitor and enforce licensing arrangements. The flotation of 51% of BT is scheduled for autumn 1984.

Defiant strike action by the telephone engineers union against BT following the connection of the private telephone system Mercury to the public network was called off on Monday.

Eric George, the acting general secretary of the Post Office Engineering Workers Union (POEU), said: "We did not want to hit customers but the effect of Mercury meant we had no choice." The union denied that it had climbed down over the strike.

Engineers will continue to re-

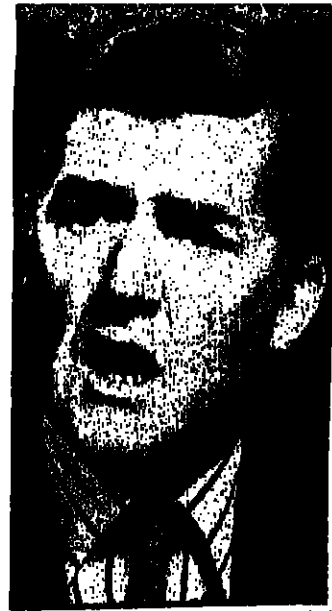
fuse to work on Mercury connections and the union said it would react if any other members are sent home for refusing to make connections, or if management do the work.

Plans are also going ahead to hold a special conference of all the unions with members in BT in September to discuss what action to take against privatisation.

There was a further protest over the bill this week when John Lyons, a BT director, resigned over the government's plan to sell 51% of the business. Lyons said he would not be party to "implementing this policy", adding "I believe BT should be retained in the public sector even if partly financed by private capital."

The reintroduced Telecommunications Bill is not miles away from that which had its third reading in March. One difference is that it gives the Secretary of State powers to help develop apparatus for use by the disabled. This will protect the jobs of billed PABX operators and encourage development of equipment for home use.

Parkinson said that a draft of the



PARKINSON... Undeterred.

BT licence will be issued for public comment in October this year. This licence will have "provisions to protect telephone users in rural areas, the network of call boxes, the 999 service and facilities for the disabled."

It was stressed that the government is selling BT as a single company.

## Sperry wins \$1bn Canadian order

by John Kavanagh  
SPERRY has notched up its biggest ever contract with a \$1,020 million order for weapons control and communications systems for the Canadian Navy. The order includes \$100 million worth of computers.

This contract is Sperry's fourth in six months from the US and Canadian armed forces and takes its business in this market to over \$240 million.

Sperry is sub-contractor to Saint John Shipbuilding and Dry Dock, a Canadian firm which is building six frigates and modernising four destroyers for the navy. The two companies have been bidding for the contract for five years.

Sperry will do much of the work in Canada. The computers will be built at its plant in Winnipeg, while other work will be done by a new subsidiary, Paramax Electronics of Montreal, formed to handle the project.

Programming will be handled by the Computer Systems division, formerly Univac, in St Paul, Minnesota. The project is expected to

last nine or 10 years.

"We picked Sperry as a partner because of its weapons systems experience in the US," said John Shepherd, project director at Saint John Shipbuilding. "It was important that the systems were based on existing proven equipment."

Around 30% of Sperry's business is in electronics for the defence and aerospace industries.

## Microsoft boss quits in top level row

by Andrew Thomas  
MICROSOFT president Jim Towne has quit the company following a rift with chairman Bill Gates. Towne joined the US micro software house from Tektronix a year ago, with then-president Gates stepping down to accommodate him.

Towne's departure is seen as a further move by Gates to get Microsoft into the lucrative consumer marketing area. Towne's background is technical rather than marketing and a Microsoft spokesman admits that the direction chosen by Towne was different from that favoured by his colleague Gates.

Gates has wasted little time in naming Towne's successor. John Shirley, from Tandem, starts work later this month.

Shirley has been with Tandem for 25 years, and was involved with its first moves into computers and the setting up of Tandem's European operations. His experience is in merchandising, retailing and mass marketing.

Microsoft has just announced an integrated software package for the



GATES (left) and TOWNE pictured together in happier times.

Tandy TRS-80/100 portable micro, which was developed jointly by Tandem and Microsoft.

"Tandy has long been a customer of Microsoft," said Scott Oki, the software company's vice-president for international operations. "And Shirley has a good understanding of Microsoft's aims and operations."

While Shirley looks set to fit in neatly with Gates' plans, his predecessor has found employment with Oregon CAD firm Medhus.

Although Towne was unavailable for comment, a Microsoft spokesman claimed the outgoing president had said that part of the reason for his resignation was to make room for someone better suited to helping Microsoft be-

come stronger in consumer marketing.

Another part of that reason could be some feeling of unease in the UK industry concerning Microsoft's ability to come up with the goods. UK distributors claim that Microsoft is not delivering product.

Phil Bowe, of Tamsay, said he had placed orders worth five figures, but had not had any deliveries since April and was having to turn customers away.

Microsoft UK general manager David Fraser admitted the delays. "It's true we're running one or two weeks behind. We're under a lot of pressure, but anyone who ordered in April and has paid will have had it by now."

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# Parkinson affirms BT's privatisation

by Philip Hunter

DEBATE on the Information Technology Bill killed by the election took up much of the first full week of the new parliamentary session. Cecil Parkinson made his Commons debut as Secretary of State for Trade and Industry with a spirited defence of government plans to remove British Telecom from public ownership.

And Margaret Thatcher commended the Telecommunications Bill, which has now had its formal first reading in the Commons. "We must adapt to change if we are to succeed in the modern world," she said.

"To those who are fearful of industrial and commercial change, we point out that the real threat posed by the new technology is that our competitors may use it and we shall not," she went on.

Thatcher said that support for new technology was one of the five main planks in the government's strategy for economic recovery.

But Tory MP for Milton Keynes, William Bennion, thought that government support could be better still. MPs might not be aware that the Japanese government had just given £2,000 million

to industry to develop the next generation of computers, he said. Britain had not approached that sort of commitment. Unless a committee was set up to examine the effect of new technology on jobs, parliament would be condemned by those who had just elected it, Bennion added.

Legislation from the government's white paper on cable services will start before Christmas, Leon Brittan told the Commons while making his debut as Home Secretary. And the government remained committed to the other important Home Office Bill on Data Protection.

The aim was twofold. First the government wanted to reassure those who saw computers as a threat to privacy.

Second, the Bill would enable Britain to ratify the Council of Europe convention on data protection, to ensure that we were not excluded from the enormous commercial opportunities flowing from international exchange of data, he said.

The Inland Revenue is fast catching up with computerisation of the tax calculation and collection, claim tax chiefs in their annual report to parliament. Development of the computerised system for the PAYE work of local tax offices is well advanced and is scheduled for completion late 1987 or early 1988.

The Commissioners of the Inland Revenue say in their report that acquisition of more modern equipment will make it possible to consider more imaginative applications of computer facilities in communications, electronic mail and information systems.

But in the Commons, the computerisation of PAYE, and social security benefits, was criticised by a Tory MP. Sir Brandon Rhys Williams said that instead of welcoming the computer for the opportunities it provided for innovation, civil servants were trying to find ways of adapting computers to fit the complicated tortuous manual methods used to administer PAYE which they had inherited from the past.

In their report tax chiefs admit that computerisation of routine collection and accounting had been beset with problems.

And Williams rubbed salt in by claiming that the reason for the problems was that the wrong approach had been adopted from the start. They should think the system out first and lay it out later, he said.

Information Technology Minister Kenneth Baker promised the Commons further government measures to promote the transfer of technology from research into industry. A government statement would soon be made on the initiative to bring higher education and industry closer together.

Much time in the Commons was spent last week recovering old ground in the telecommunication debate. Labour remained totally opposed to the privatisation of British Telecom, while the SDP was, as before, more equivocal.

SDP MP Ian Wigglesworth welcomed government efforts to break down monopolies, but questioned whether it was right to go so far as to denationalise BT.

The government has extended the Scottish Microelectronics Development Programme set up in 1980, to promote application of microelectronics in Scottish education (see story page 3).



CHARTERS... TV components solved his problem.

## Computer Automation produces junk solution

by John Riley

MINICOMPUTER manufacturer Computer Automation scored junk yards for bits from old TV sets to solve the problem of producing a broad band local area network cheaply.

The network, called Syfanet, to be launched at the IBM User Show next week, links Computer Automation's Syfa minicomputers and any microcomputers with a RS232 interface via a broad band which allows data rates of 10 Mbits/sec. Syfanet connects with IBM mainframes through IBM's SNA hierarchy, and costs the same as a baseband network.

Two problems have held up the development of cheap broad band networks. Firstly, the high cost of radio frequency modems, and secondly, the difficulty of implementing CSMA/CD (Carrier Sense Multiple Access with Collision Detection) on broad band.

"The component problem was solved by using intermediate frequency components from domestic TV sets," said marketing communications manager, Roger Charters.

"The IF strips change the broadcast signal frequency down to a lower frequency enabling it to be handled easily by the internal circuitry. It is a thoroughly worked out technology and is very reliable. They allow us to use only a narrow area around the 48 MHz frequency out of a 300 MHz waveband."

The second problem, of avoiding packet crashes brought about by signal attenuation causing data collision when two stations are communicating at the same time on broad band, was solved by two new elements.

The emphasis is on collision avoidance before the data is sent. The solution was to introduce a timing technique where each node listens twice for other traffic on the line before transmitting a data packet.

The two developments bring the cost of the LAN down to £13 for a node to get a workstation on to the broad band bus.

Only continuing start-up losses (£19.3 million by electronics firm lamos restricted the NEB's operating profit to £4.21 million. After tax was £3.81 million - compared with a loss of over £39 million last year.

A new star performer among National Enterprise Board companies was peripheral manufacturer Data Recording Instrument, which turned its 1981 operating loss of £5.88 million into a profit of over £3.5 million.

Data Recording was picked out for special mention by the board's chairman Sir Frederick Wood in his introduction to the annual report. He is setting in motion the sale of the company to the private sector.

A statement on the future of the board and the National Research Development Corporation under the umbrella of the British Technology Group has been expected since the start of the year. The new trade and industry secretary, Cecil Parkinson, is now expected to make a statement this month.

Sir Frederick warned that the British Technology Group should not be judged simply in terms of its profits.

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WOOD... "Activities of a state-backed body may not be a success in commercial terms."

## Profitable NEB waits nervously

by John Kavanagh

THE National Enterprise Board has moved into profit on the eve of a government announcement on its future.

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Sir Frederick warned that the British Technology Group should not be judged simply in terms of its profits.

"My colleagues and I firmly believe that the justification for a state-backed body supporting the development and growth of high-

technology ventures lies in the very fact that its activities may not necessarily be a success in purely commercial terms," he said.

"If it were otherwise, the private sector should and would fill the bill."

He added that the British Technology Group had a "vital role to play in the rejuvenation of British industry."

The National Enterprise Board's move into profit was helped by the disposal of the disastrous software marketing firm, In-sac, and the Naxos office systems company in 1981. Those disposals largely accounted for the 1981 loss.

The biggest computer industry loss-makers apart from Inmos are now Argon, the viewdata specialist, and the office automation firm, Q1.

Other NEB investments include systems builder Systime and software houses CAP and Systems Programming.

Dividend and interest income from these and other firms was £9.75 million.

The board invested £12 million in companies last year, compared with over £52 million in 1981. This was partly because more of its investments are in start-up companies which need smaller amounts.

In addition, government guidelines introduced in 1980 said all investments should be made in partnership with private backers, rather than solely by the National Enterprise Board.

# British standards could lose lead

by Donald Kennett

BRITISH teletext and viewdata standards now dominate the world market, but they could lose their lead if an internationally agreed set of standards takes off commercially next year.

According to a survey by consultancy CSP International, the UK standards are in use in 98% of the 2.25 million teletext and viewdata sets in use in 26 countries.

But West Germany is planning a big launch in September for its delayed new generation viewdata system. It is based on the enhanced display standard agreed by the European PTs in 1981.

Most of the display and decoder chips for these have been made by Philips' Mullard division in Southampton, which had made 2.5 million four-chip sets by the end of last year and expects to make another two million this year.

Mullard's chips only support the UK standard, but this has not been the cause of the UK stan-

dard's dominance, according to Mullard consumer circuits marketing manager Peter Bacon. "We've made chips for the market we see," he said. "We've made chips for the French standard, but the market for them is mostly in France so French manufacturers have taken over. Chips could be developed for the Canadian system too, if that started to take off."

"It's a market driven situation. America is still studying standards, but British standards are in use everywhere except Canada and France."

The CSP survey found that the UK had the most teletext and viewdata sets in use. It had more than a million sets, followed by Holland, West Germany and Sweden with about 250,000 each. Most of them are teletext sets.

France and Canada, whose standards have been rivals to the UK's, have 1.2% and 0.2% of the world market respectively, according to CSP. The survey discounted

200,000 terminals in use with the Source and Dow Jones News Retrieval in the US, on the grounds that they did not use viewdata technology.

At Videotex 83 in New York City last week, IBM demonstrated an enhanced version of its Series 1 Videotex System software (SVS) which supports the North American Presentation Level Protocol Syntax (NAPLPS) display standard proposed by AT&T in 1981, as well as UK Prestel standard.

But information to be accessed by each type of terminal has to be stored separately in the same database and, more significantly, while Prestel-type displays can be prepared online from a variety of terminals including the IBM Personal Computer, NAPLPS-type displays have to be prepared offline on special editing terminals.

IBM's software is due to be available in the second quarter of next year at a one-time charge of \$12,500.

# Texas cuts 750 home jobs

LAST week Texas Instruments laid off 750 employees at its home computer factories in Lubbock and Abilene, Texas.

The company said those laid off included 700 temporary workers who were hired at the end of 1982 and beginning of 1983 when Texas was preparing to increase production of its 994A home computer. The expected increase in sales did not materialise and early in June the company said it could lose up to \$100 million in the second quarter as a result.

At the same time Mattel, maker of Intellivision, has laid off 260 people at its Californian computer plant.

Both Texas Instruments and Mattel have suffered severely from a price war at the lower end of the microcomputer field. Texas Instruments warned of a coming \$100 million loss for this quarter, following Mattel's \$20 million loss at the end of last quarter.

There are rumours in the US that Texas Instruments may be preparing to abandon small computer manufacture altogether.



MESSSENGER... "People have changed their minds on CICS."

## CICS users get one more online alternative

by Claire Gooding

ONE of the strongest contenders in the IBM CICS market is about to break into the UK - while lawyers contend its future in the US. Future Software, now setting up to sell the CICS add SGT here, is locked in a legal battle with Panosaphic.

SGT is an online interactive CICS replacement, and will come into direct competition with other CICS alternatives such as Cloum's Mantis and Oxford Software Corporation's UFO productivity tool, sold in the UK by Fee Ltd and Systems Resources.

Future Software Inc claims to be cleaning up the CICS market in the US because SGT's performance and facilities are streets ahead of its competitors. But, as the rivals are about to point out, users may hold back from purchase while the future of SGT hangs on a lawsuit.

Future Software filed a suit against Panosaphic in the district court of Salt Lake City this April for breach of contract. Panosaphic says that it owns the product, which was originally written by SGT Corp, also charged by Future with breach of contract. The dispute centres on the marketing rights sold by SGT to Future. Pan-

sophic later bought the product entire, and with it, SGT's licence obligations.

Future Software Ltd is being set up in the UK by Brian Messenger, who has worked with both Panosaphic and Future Software Inc.

According to Messenger, SGT's reputation stands so high that competitors are running scared, offering such inducements as free software to keep their customers.

"We're getting a 30% hike in the US for all the customers that try it," he said. As yet there are no UK users but Future Software Ltd, at present only three strong, is introducing the product by a series of seminars later this month. It is also offering a discount to early users on the standard prices of £15,000 for DOS and £18,000 for OS versions.

Panosaphic's position was stated by Mike Ward, European marketing support manager. "Panosaphic regards SGT as its own product. If we sell the product and it is superb, we will be selling the same software in the UK, under the name General."

Messenger remains unfazed. "We've already had inquiries where people evaluating CICS are changing their minds in favour of SGT," he said.

## EEC debates temps

by John Riley

THE European Bill on temporary workers, which is bitterly opposed by the UK computing service industry, is being debated this week by the European Parliament in Strasbourg.

The Euro MPs will discuss a report drawn up by MEP Ben Patterson on behalf of the influential Parliamentary Committee on Social Affairs and Employment, which attempts to modify the original Commission directive.

This was issued in April last year, largely as a result of trade union pressure particularly in France and Germany. Among the proposals which could hit the data processing industry are:

- Contract work limited to three months, renewable to a six month maximum.
- Temporary staff to be paid the same as permanent staff.
- Companies to reveal to their

permanent staff the qualifications and pay rates of temporary staff, as well as the fees paid to contract agencies.

- Agencies to be stopped from demanding a transfer fee if the contract worker takes on permanent job with the client.
- The client to be liable for temporary workers' wages if the contract firm goes bankrupt.

Patterson's report includes amendments that would scrap the last two of the above articles. Last February, an alliance of Socialist MEPs caught the majority Conservative members of the Social Affairs and Employment Committee on the hop and voted effectively to nationalise contract agencies. That amendment is expected to be thrown out this week.

The British contract industry has vigorously opposed the directive.

Leader Comment - page 17.

## ADR sees eye to eye with Visicorp on PC link

by George Black

APPLIED Data Research (ADR), the big US software house has announced plans for linking IBM PCs and mainframes.

Like the other challengers in this field the productions are expected to appear on the American and European market towards the end of this year, or possibly early next.

ADR's approach will be to re-market Visicon windowing system with the value added in several different ways.

The new range comprises PC-Datcom, the relational database connection, ADR PC-Empire, the financial modelling system, ADR PC-E-Mail, electronic mail, and ADR PC-Roscoe and ADR PC-Volite, online development systems for IBM's OS and DOS.

There will also be three new utilities, ADR Link, providing a new interface between mainframe and small machines, ADR Sign-On, a new password system, and ADR-Editor.

Visicorp president Dan Flystra and ADR chief Martin Goetz, Jo Parrelly and Ken Sloan introduced the joint development strategy last week after months of talks between the two firms.

Visicorp appears to be establishing a central position in the networking market after its phenomenal success with Visicalc in the standalone sphere.

Informatics said in April it would be teaming up with Visicorp to develop a series of software products for the IBM PC-mainframe environment. The new deal with ADR logically complements that step.

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## Control of Scottish schools scheme shifts locally

by John Kavanagh

DAMNING criticisms of the government's £1 million scheme to put microcomputers in Scottish schools have led to the project control passing from central government to the local authorities that run the schools.

The new Microelectronics in Education Committee of local government, industry and union members will be set up to take control of the Scottish Microelectronics Development Programme in November. This was announced by Scottish Secretary George Younger last week.

The change in control was welcomed by Professor Noel Ent-

wistle of Edinburgh University's education department. He and research fellow Phil Ode produced the hard-hitting report on the programme which showed that a large majority of school teachers were disenchanted with the project.


"The old committee was carefully designed to be dominated by the Scottish Education Department," Entwistle said. "We called them 'Borwick's boys'. We called them 'Borwick's boys' for more local government representatives. This is a big improvement."

Also on the cards is an expansion of the central program library, information service and promoting activity in Glasgow. At present there are 25 programme staff.

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COMPUTER WEEKLY JULY 1983



McHUGH... Aims to move on to unlisted securities markets in 1984/5.

## Future raises £2.75m to back push overseas

by George Black

SCOTTISH micro maker Future Technology Systems made a private placing of 20% of its stock, raising £2.75 million, last week and the offer was heavily oversubscribed.

The placing was supported by Merchant bank N. M. Rothschild on behalf of clients, as well as Prudential Assurance, Montagu Investment Management, Edinburgh Investment Trust, Abingworth, British Linen Bank and five other financial institutions.

The money will be used to back a push into overseas markets, following Future's recent promotion trip to the National Computer Conference in California. Now it wants to launch operations in both the US and Europe. Earlier this year a distribution channel in Holland was set up.

Annual results are predicted to show growth from £5 million to £6.4 million income, with a possible 100% increase next year.

Future has this year doubled its factory space in Beith in Glasgow and opened new offices in London's Knightsbridge. The payroll has gone up from 40 to 120 in the last year, on the strength of its 16-bit micro, the Series 88, which is based on Intel's 8086 chip.

The company was set up with aid from the Scottish Development Agency, Scottish Northern Investment Trust and Castle Finance, which recently increased their funding of the enterprise. Last year Future won a British Technology Group award.

Managing director Peter McHugh aims to move on to the Stock Exchange's unlisted securities market in 1984 or 1985.

# Japan and UK step up exchange

by Donald Kennett

STEPPED up exchange visits between Japanese and UK telecommunications teams have been agreed at the second round of talks on co-operation between the two countries in Tokyo late last month.

The talks were initiated by Sir Keith Joseph when he was Industry Secretary in 1981 and the first round was held in London in June last year.

Since then, researchers have visited each others' laboratories and working groups have discussed technical, international and policy matters.

Both countries regard the development and spreading of telecommunications services and equipment as an important engine for economic recovery. They have already co-operated on drafts for a constitution for the International Telecommunications Union, a part of the United Nations Organisation, and plan to discuss a permanent charter for it. They are also discussing a possible joint project to be demonstrated in a developing country for World Communications Year (this year).

Co-ordinating standards development and facilitating market entry on a mutually acceptable basis were two key issues discussed, according to a statement issued on behalf of both delegations. The UK delegation was led by Jonathan Solomon, an Under Secretary in the telecommunications division of the Department of Trade and Industry, and included senior staff from British Telecom and BT International.

They met staff from Nippon Telegraph & Telephone (the national carrier), Kokusai Denshin Denwa (Japan's international carrier) and the Ministry of Posts and Telecommunications.

The delegations agreed: to exchange papers on a telecommunications policy appropriate to the 21st century; to proceed with a memorandum of understanding on long-term exchange visits by technical personnel working on fundamental research; to continue the mutual visits by high-level personnel, to increase the number of two-way contacts and to strengthen further relations in operational matters; and to exchange views continuously on topics such as enhancing public networks and their performance, and examining the common ground faced by the two governments in creating a new balance between traditional and new suppliers.

Standard discussions centred on videotex, satellite broadcasting and visual telecommunications. Policy discussions included the implications of competition for networks, and future developments in mobile telephony.

The possibility of giving the OECD (Organisation for Economic Co-operation and Development) a greater role in telecommunications policy was discussed. The OECD is known to favour increased competition in telecommunications. Both delegations agreed that the OECD secretariat might need to be strengthened to handle it.

Luton-based consultancy Mackintosh International is to conduct a multi-client study into opportunities for European telecommunications manufacturers in the Japanese digital information Network System.

## Reagan's Small Act lures Ferranti into New York

by John Kavanagh

FERRANTI plans to invest up to £15 million in US high technology by taking minority interests in US firms - with the help of the Reagan government.

The big UK firm has set up Ferranti High Technology in New York to put money into electronics companies under the US government's Small Business Investment Act. This allows investors to borrow government money at good rates for investment.

The move is part of Ferranti's expansion in a country which, it says, accounts for 50% of the world business in its main markets. Last year the US accounted for around just £20 million of Fer-

ranti's total turnover of over £370 million.

Ferranti has put an initial \$3 million into Ferranti High Technology and expects to borrow another \$12 million from the US government.

The new company has already been a member of investment groups which have put \$5.5 million into an array processing firm, Aptec, and \$1 million into Digital Pathways, which specialises in voice message systems.

Targets include companies "active in advanced technology, both civil and military", especially firms which could sell or build Ferranti products in the US or license the manufacture of pro-

ducts of their own to Ferranti. Typical investments range from \$200,000 to \$600,000. This implies that Ferranti could have stakes in at least 30 companies.

"We're building up selective investments to give us strength on the ground and an ear to what is going on in high technology," Ferranti said.

Ferranti's merchant bank, Baring Brothers, owns 20% of Ferranti High Technology, while advice is coming from the US venture capital and takeovers specialist Aminvest Corporate Services.

Outside the new company Ferranti has invested \$40 million in US takeovers and start-ups.

### SALES BRIEF

#### BL chooses SattControl equipment

BRITISH Leyland has chosen computer equipment from SattControl to automate its commercial vehicle part distribution centre at Chorley in Lancashire. The equipment worth over £500,000 will be linked to an IBM mainframe for downloading of order details.

The warehouse system will handle a total of 150,000 parts with a retail value of £100 million.

#### Cray sells 25

CRAY Research has picked up another order for its top range X-MP/24 supercomputer, bringing the company's total sales this year to about 25. The buyer this time is the US oil company, Chevron, which will use it to process data gathered during oil exploration and to develop new methods.

#### Steel firm spends

SKF STEEL is spending £100,000 to upgrade the computer installation at its £1 million Steel Service Centre in Wolverhampton. The new system will improve stock control and help process information needed for manufacturing and help process information needed for manufacturing processes like cutting to length and heat treatment.

#### Sony set for £37m

THE decision by ACT to opt for Sony's 3 1/2-inch micro floppy disc system for its new Apricot portable computer could bring the Japanese company £37 million in the next three years. ACT is Sony's first major UK customer, and marks its entry into the OEM business.

#### Scicon contract

SCICON has won its first contract in South America for Sciconic, a package of mathematical software. A Prime 550 computer will run the software at Quito in Ecuador for Inceel, the state electricity company.

#### Distributor's tool

NIKDORF Computer has sold one of its 8870 systems to the UK distributor of a West German machine tool maker. It will be used to run Comet software for the usual accounting applications like stock control and invoicing.

#### Burroughs deal

AMERICAN Express has lodged a £300,000 order for 90 Burroughs foreign exchange terminals to put in its bureaux de change in the UK and Europe. Several hundred more Burroughs Portronic terminals will be installed by American Express round the world in the next three years.

#### Australia buys

AMDAHL's Australian subsidiary has been selected to supply 580 mainframe computers and model 4705 communications processors to the Australian Department of Social Security. The contract is estimated to be worth more than 24 million Australian dollars. The first equipment will be installed in the Australian National Computer Centre in July 1983.

#### Universal orders

UNIVERSAL CMS, the Windsor-based software house, has landed £250,000 in orders for Burroughs B90 based systems. The five orders are from British clothing manufacturers for B95 and B96 minicomputer systems using the Universal Clothing System.

#### Vax take over

THREE Digital Equipment Vax computers are replacing a 12-year-old ICL 1904S mainframe at Strathclyde University. The new system will support 120 terminals and will be used for research and teaching students.

# Familiarity breeds a brand new terminal.



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## PUBLIC HEARINGS ON CABLE

### CABLE-THREAT OR PROMISE?

The Government has announced its plans for the 'immediate' allocation of interim cable franchises as a first step towards cabling much of Britain. The Greater London Council and Sheffield City Council are holding public hearings to look at what cable will mean for television, telecommunications, the media, education, homeworking, local Authorities, the voluntary sector, libraries and community access, and to ask whether cable is something we either want or can afford.

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## IBM gives to 20 US universities

by Howard Karten

TWENTY US universities have been named as recipients of IBM 4341 systems and CAD/CAM software for educating engineers.

The universities named by IBM in its most recent academic donation programme will each receive an IBM 4341 Group II, some graphics and alphanumeric terminals, and packages licensed by IBM from other vendors.

IBM will also provide royalty-free licences for systems software. The 20 schools were selected from among 115 that submitted proposals to IBM last autumn, following announcement of the programme. Value of the hardware and software was estimated by IBM at \$40 million.

IBM will also shortly be naming five additional universities as recipients of an additional \$10 million in cash grants. In announcing the academic recipients, IBM chairman John Opel said: "To remain competitive in world markets engineers must be educated in both traditional and advanced manufacturing technology."

In recent months, more and more high tech corporations have begun making public statements of concern regarding the future of engineering and science education.



Hafferty gets a feel for the Lotus with Bill Kelly of car contact hire firm Wisconsin Contracts.

## Give sales staff incentives

by John Kavanagh

TOP incentives for sales staff are now vital ingredients of success in the computing business.

That is the view of Mike Hafferty, sales director at UK communications firm CASE, who is offering the use of a Lotus Esprit car to the company's top sales person each month.

"There's an absolute need for good incentives, mainly to motivate people," he said. "It's not just the material incentives themselves but the fact that they create a sense of urgency, competitive spirit and fun."

Hafferty said incentives were widespread in the computing business because it was a US-domi-

nated industry and incentives were a US idea.

"I think US companies are right," he added. "If you look at companies with good marketing you find it's incentives that bring results."

CASE incentives include monthly cash prizes and quarterly and annual holiday prizes.

The Lotus has replaced a Porsche: the 40-strong sales team decided the UK-built car was "more fun".

Systems builder Systime also offers a Lotus Esprit as a monthly prize - and goes one better with a year's use of a Rolls-Royce for the top sales person.

# Bankers baulk at computer capital

by George Black  
BANKERS must be able to see a minimum profit of 10 times their investment within five years if they are to be attracted to computing. Sir Timothy Harford, the merchant banker who floated Micro Focus and ACT, gave this guideline to an assembly of industry principals last week.

"You could make three or four times your money on the ordinary stocks and it wouldn't keep you awake at night," he told members of the Computing Services Association.

Harford, of Singer and Friedlander, spelled out for his audience what hurdles they had to jump to get the financiers to come up with the cash.

Many projects were just too small to interest them, he warned. Any concept involving less than £250,000 was not likely to arouse

much interest in investors. It was incredibly difficult for computing entrepreneurs to find out just who might be prepared to help, he admitted.

A Darwinian law seemed to operate by which most people gave up, faced by the horrific problems. Those that refused to give up developed into the superior species of capitalist dreams.

Local bank managers were not necessarily the right people to approach. Sometimes they did not even know what services their own firm offered.

Questioned by Jonathan Stuart, of Hambro's, on whether current valuations of high technology companies were realistic, Harford admitted: "A lot of those around don't justify those ratings."

He criticised computing bosses who came to their bankers with propositions that were "long on

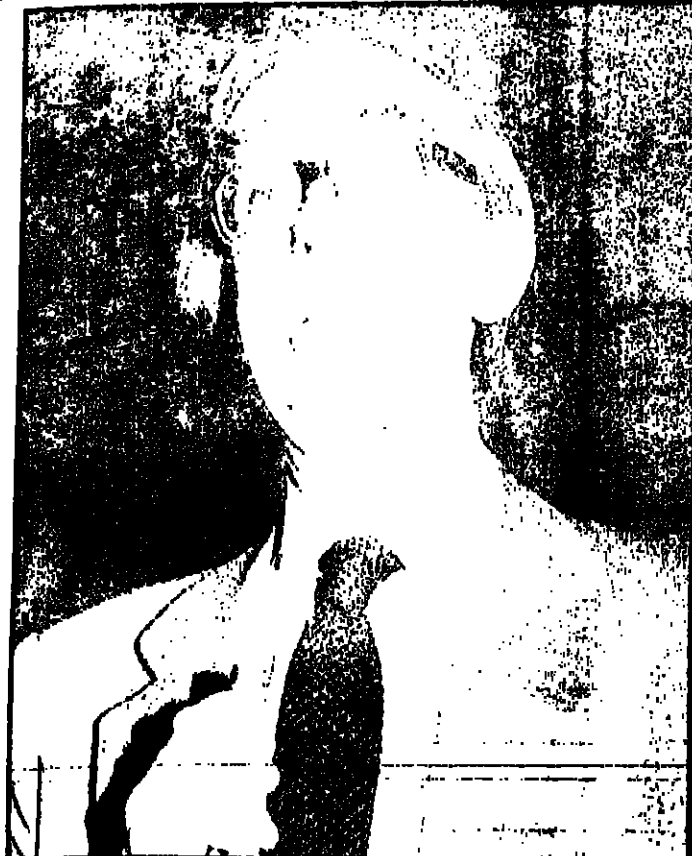
visceral, but short on assumptions".

"You have got to have thought the thing right through, not just relied on something being technically superb."

There was a severe danger of underestimating the research and development costs of innovative projects. Initial losses were inevitable and it was difficult for anyone to calculate the timescale. Bankers had little to lend against except faith, hope and charity, as he put it.

"It's a sad fact of life that more people believe they can create a profitable business than really do have the ability to do so," he observed.

Bankers had a big problem sizing up a business in which the main asset was people. They were still happier about spending on bricks and mortar.



HARFORD... "Many projects too small to interest bankers."

## Management takeover shakes off US shackles

by John Kavanagh  
A UK peripherals distributor is aiming at 35% annual growth after freeing itself from US ownership with a management takeover.

ISG Data Sales says its growth was limited because profits were going to the US parent - but now it is looking for a turnover of £4.5 million in five years with backing from the UK recruitment and engineering group Trident Computer Services.

ISG Data Sales was formed in 1978 by ISG Sales, a US firm which matches US products with European distributors. The UK firm was the only direct subsidiary. Most of the profits went to the parent, leaving the UK company starved of cash.

The 1981 profit was £88,000 but last year a new microprocessor development system failed to take off after expensive promotion and the company only broke even.

"ISG agreed to sell because of our results and because it felt that running a UK subsidiary was not something it really wanted to do," said Jacques Schultz, who led the management buy-out.

"We felt too much of our profit was being siphoned off to feed the US arm and we also needed the financial clout and extra management skills associated with a much bigger company."

ISG Data Sales was bought for a five-figure sum by managing director Schultz, technical manager Chris Dunk. They then sold 50% to Trident for £22,500 - but more Trident money is being negotiated. Schultz owns 20% and Parker and Dunk have 15% each.

Trident managing director Mike Ball said his company had wanted to move into the peripherals business. It had formed Trident Technology to sell display terminals, but that was now disbanded and the peripherals business would be concentrated on ISG. Selling peripherals would be a good way of building up Trident's engineering business, Ball said.

ISG is aiming at sales of over £1 million and a profit of £90,000 this year. Trident has a turnover of £4.5 million. The company is quoted on the Stock Exchange's Unlisted Securities Market.

## P&O sails into specialist IBM systems division

by Philip Hunter  
P&O COMPUTER SERVICES (PCL) has set up a specialist IBM Systems Division in an attempt to regain lost ground in its traditional IBM market.

Previously, the IBM systems were developed by the company's consultancy division, which also embraces the three successful minicomputer turnkey work for Digital Equipment and Data General computers.

"We felt the IBM part was not making as much impact as it might," said Paul Carr, head of the new division.

The other half of PCL is the time-sharing bureau division, which still accounts for more than 50% of profit and turnover. The Bureau has pulled in 20 clients in the last six months, including software houses like CAP and ADR which use it for development work.

PCL has also increased its independence from the P&O Group, with 65% of clients coming from outside, compared with 30% at the start of 1982. But this could cause problems if Trafalgar House is successful in its bid to take over the whole P&O Group.

Trafalgar House has a different philosophy to computer services, with a DP division dedicated solely



CARR... Hopes for impact.

## US disc firm signs \$59m deals

by John Riley  
THREE contracts worth £59 million were announced last week by US disc drive manufacturer Micro Peripherals Incorporated (MPI) to supply Wang, Burroughs and Rana Systems in the US.

The biggest deal is with Wang, to supply \$24 million worth of MPI's Model 52 double-sided 48-tpl floppy disc drives. Chris Scott, European sales manager for MPI Europe, said they would be used mainly with Wang's Professional Computer.

Burroughs has ordered \$15 million worth of floppy disc drives to go in its Model 820 business computer, and Rana Systems, of Chatsworth, California, has placed orders to the value of \$20 million. The disc drives sold to Rana will be incorporated in peripheral systems that the company manufactures for Apple, Atari and other microcomputer companies.

MPI's annual turnover is in the region of \$100 million, and the Berkshire-based European subsidiary provides sales and services support and controls the network of independent distributors throughout Europe.

The company manufactures the Slimline which, with a height of 2in, is claimed by MPI to be the world's smallest 8in floppy disc drive.

## Gould claims it has a virtual world lead

by Donald Kennett  
A CLUTCH of products announced by Gould SEL is claimed to give the company the largest range of fully compatible virtual memory computers available from any manufacturer in the world.

A deal with Convergent Technologies has brought the company two machines for the low end of its range, which it saw as essential for its move into general purpose computing from its traditional market in high performance real-time systems.

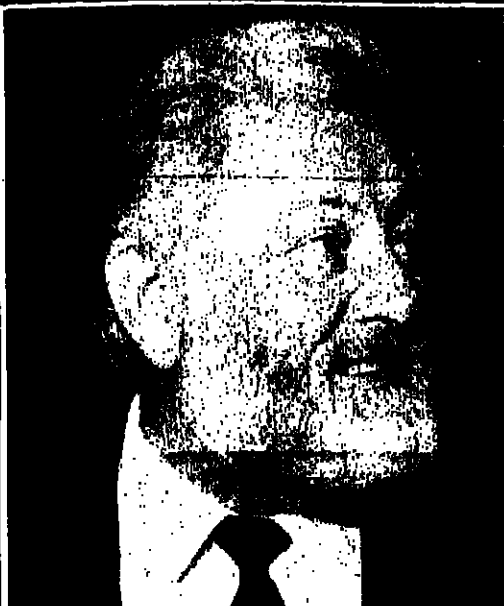
At the same time it has built Ethernet interfaces and implemented a variety of communications protocol emulators for all the machines in its range to provide local and wide area communications capabilities.

It has chosen Unix, which was implemented on its larger machines six months ago, as the operating system to provide software portability across the range. And it has implemented what it claims is the first distributed version of virtual memory Unix for the PS-3000 multi-processor based low-end mini which will support local clusters of up to 128 terminals.

Other systems in this newly-defined range, called Power Stations, are the PS-1000 (also from Convergent), the PS-5000 (based on Gould's existing Concept 32/67 32-bit mini) and the £1,000 8088-based Power Terminal-Intelligent VDU.

UK marketing manager David Lines said Gould had made a commitment to buy workstations from the whole of Convergent Technologies' range to integrate with its own systems and interface modules. Convergent was planning an ambitious expansion of its range including a radically different multi-processing architecture.

The two models that formed part of this announcement were the first of a new generation of Convergent products that were exclusive to Gould, he said.



DAVIES (left) takes early retirement at 55. ELSBURY (right) takes over as deputy managing director.



## Racal names its crown prince

by George Black  
DAVID ELSBURY has become heir-apparent of the chairmanship of Racal Electronics following the early retirement of deputy managing director Leighton Davies.

Davies, 55, was chairman of the Racal data communications group. A company spokesman said there was no suggestion of ill-health and it was not normal policy to offer retirement to staff before 65.

Davies will continue to serve the firm as a consultant.

Elsbury, 47, steps up to the newly-created post of deputy chief executive and Sir Ernest Harrison's right-hand man. The other deputy managing director, Douglas Morrell, retired last year. Harrison is due to retire in eight years.

The new deputy joined Racal Engineering in 1956 as a junior radio tester at Bracknell. He became general manager of Racal-Mobilair at Reading in 1970 and

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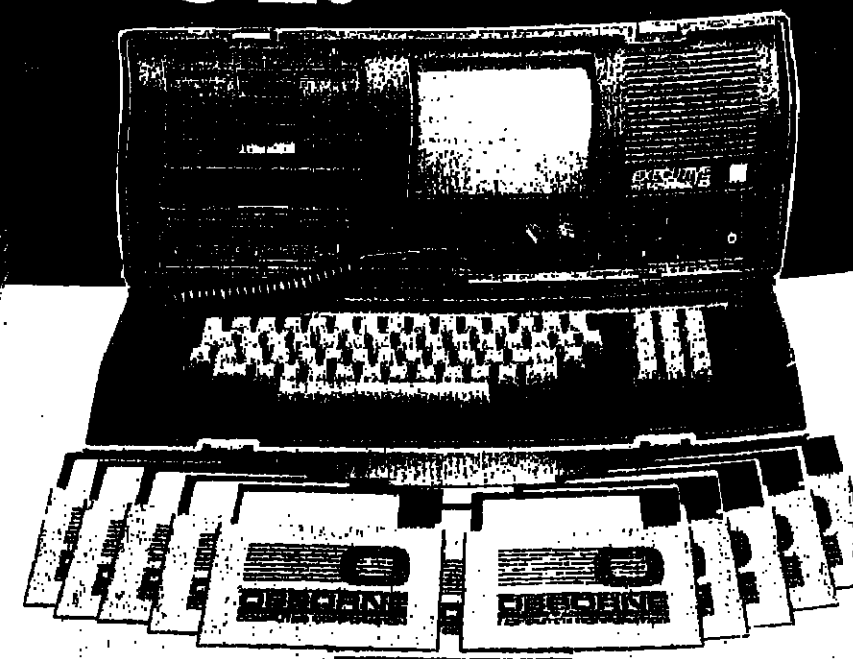
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# OSBORNE

## COMPUTER CORPORATION

Someone has to lead the way



# Watch out, there are whales about

by George Black  
YOUNG and healthy software houses had better watch out for bigger fish in the ocean who may be about to gobble them up.  
This is the picture emerging from the take-over in April of prosperous McCormack and Dodge by a whale, Dun and Bradstreet.

On a visit to London chairman Jim McCormack revealed that two top publishing corporations and two majors of information technology had been among the seven bidders for his business.

The publishers were Prentice-Hall and McGraw-Hill - the others included Westinghouse and Control Data.

"A lot of very big concerns are anxious to move into this area in a

big way - Dun and Bradstreet was just the one that fitted our strategy best," he said.  
McCormack and Dodge had decided that if they were to keep up in the ever-more-competitive world of mainframe financial software they had either to go public or find a wealthy parent. MSA and UCC had taken the first route. Software International the second. Meanwhile Dun and Bradstreet, the \$1.5 billion revenue New York financial and marketing services group, had decided to diversify into low market-share but fast-growing new technology concerns. Its chairman Harrington Duke is now looking around for "stable partners" for McCormack and Dodge.

"They need people like us to

provide their profits in the 1990s," McCormack observed.  
He was in Europe to address a user conference in Amsterdam, where he introduced clients to the firm's Millennium project - a new software suite involving the IBM PC-mainframe link due for launch here at the end of the year.  
"We don't plan to follow MSA into the manufacturing software arena - at least not yet," he said. "No-one yet has made money out of it and we're backing away for the time being."  
McCormack and Dodge is "building a wish-list" of other new software projects it considers worth undertaking. Corporate bosses will see it before the end of this month.  
"They have let us do what we



MCCORMACK... "Big concerns are anxious to move in."

wanted to do, as they promised," McCormack said. "Had we gone public instead we should have had to focus on our quarterly figures all the time and we didn't want to have to do that."

## Tamsys takes over MDBS from ISE-Pactel

by Claire Gooding  
MICRO software distributor Tamsys is to replace ISE-Pactel as the sole outlet of the MDBS micro database.

MDBS from the US firm of the same name was one of the first robust tools available to micro users, and much was made of its "mainframe quality" in selling to large corporations.

Mainframe consultancy Pactel has now severed all connections with the product. Eighteen months ago Pactel set up a joint marketing company ISE-Pactel, to co-operate with International Software Enterprises, the marketing arm of Micro Database Base Systems Inc.

Pactel claimed that it not been able to reach a satisfactory contract with ISE. "We couldn't get an agreement with the US" explained manager of software products division Graham Wynd. "We never had doubts about the quality of the product. But when we started the venture we had an interim agreement, and we were unable to reach a mutually agreed long-term contract."

Wynd would not reveal the extent of Pactel's investment in the defunct venture, but indicated that the returns had been less than expected.

Tamsys has had more success, having used MDBS in-house. It approached the parent company MDBS and now holds the official distribution rights. The company is also taking on the Knowledge-man database and spreadsheet, a low-cost version of MDBS.

Knowledge-man, described by Tamsys technical director Alan Hare as a "baby brother" to MDBS, sells for £350.

# Transnet switch is new departure

by Donald Kennett

LONDON-based telex bureau Transnet is diversifying into products by marketing the Israeli-designed message switch it uses in its international network.

The switch is based on the IBM Series 1 mini running the MMS/1 message management software written by Transnet's Israeli parent Manof Systems. It is designed to provide a high level of adaptability to users' requirements by offering interfaces to ICL, DEC, IBM and Wang host processes and by supporting a variety of terminals, word processors and personal computers as access devices.

It can also operate over several different wide-area networks such as the Swift international banking network, the public telephone network and X25 packet switched networks in asynchronous or binary synchronous modes. Customers' operations can be backed up or

supplemented by Transnet's bureau and support services.

Transnet opened its London bureau 18 months ago and the Manof switch has been on sale in Israel and the US since last autumn. But marketing manager Peter Errington said that the government's telecommunications liberalisation programme was creating a good environment for selling systems in the UK, too.

"A new interest and involvement in communications is apparent," he said. "Users are realising that they cannot ignore communications costs and that they can do something to control them."

"We are offering a network, managed services, communications products, support services and back-up systems that provide new standards of working, greater flexibility, more facilities, and greater levels of security and control than our customers are able to achieve on their own."

The bureau has been operating under the general licence for value-added network services issued by the Department of Industry last year. Errington said this had had an immediate effect on trading conditions.

"Before the licence, bureaux couldn't take traffic from customers electronically, they had to take it on paper tape and re-key it. Many assumptions were made about how to operate services, because nobody really knew exactly what they were and weren't allowed to do. If you asked British Telecom whether you could do something, the response typically was 'we're not quite sure but we don't think so'."

One of the features of the Manof software aimed at security of message delivery is full reporting on messages, including those not delivered. "One of the complaints from US users of BT's ILTMS (International Leased Telex Mes-



ERRINGTON... "Can't ignore communication costs."

sage Service) was that if a message is not delivered it was deleted. Our system gives full reports daily, weekly or monthly and it can be interrogated on the progress of all messages," said Errington.

"The cost of a message failing to be delivered could completely dwarf the cost of seeing that it doesn't happen," he added.

Each Series 1 will support up to about 200 lines and up to 16 processors can be linked together to form a system capable of handling hundreds of thousands of messages a day.

## Luxembourg eyes managers for its information course

by John Riley

THE smallest member of the EEC has seized the initiative to ensure that European managers get training in dealing with the information from large computerised databases.

Last week the Luxembourg government announced that it is looking for 50-60 bright candidates, preferably from the DP industry, to take part in the first diploma course in the newly founded European Institute for Information Management in the Grand Duchy.

"The problems of information handling in multi-million dollar installations are not technical problems but management problems," said Derek Barlow, who is Secretary General of the European Information Providers Association, and a director of the international institute.

That is why he is approaching information service and computer companies to send good middle managers who are being groomed

for high positions on the course, which concentrates on effective management of database and information systems.

The course comprises four 150-hour long modules which can be taken separately. They examine the information environment in the context of national policies, the managing techniques applied in information systems, the marketing and economics of information systems, and have case studies to illustrate how information is handled within organisations.

The cost is \$2,000, including computer time, for the full 600 hours of teaching and practical training. Teaching will be in French and English. There will be about 20-30 lecturers from both universities and industry.

The European Commission has a representative on the international board of directors of the institute, but is not helping to fund its administration. More information on 01-580 7693.



COLLIER... "People take chances."

## DEC fans flock to Dexpo show

by John Riley  
DESPITE cramped conditions and poor location, about 110 Digital Equipment Corporation (DEC) and software houses attracted over 3,000 visitors to Dexpo Europe, the first annual international DEC-compatible exhibition.

And the show happened at the right time, for trade for DEC OEMs has been increasing.

"People are beginning to buy on spec now, and are taking more chances," explained Brian Collier, managing director of systems house Dical.

Taking advantage of that trend were the 20 or so US companies which came to London's West

Centre Hotel to exhibit at the three day event. Most of these offered systems software. Many of the hardware products on display originate in the US, and were on their British distributors' stands.

The main exhibition hall, on the ground floor, accommodated 80 or so of the exhibitors comfortably. The other 20 or so exhibitors who were put individually in bedrooms were not so comfortable, and neither were the visitors.

One feature was the number of exhibitors using the 68000 chip and offering Unix.

A lot of people are designing controllers for Multibus, and the 68000 is the natural progression

from the LSI/11s," said Collier. "Customers are staying with DEC or going to 68000s."

Bill Dick, marketing director for Arrow Computer Systems, also had things to say on this trend: "We are seeing a bigger demand for Unix based systems and for the 68000 with Unix." Arrow offered a Q-bus compatible MC68000 processor board running Unix.

Unix and Unix based facilities were offered by several companies, including Logica's complete emulation of Unix under VMS, and Software Ireland's Dihal-compatible language for Unix.

However, Unix did not dominate the software side of the show.

Wilkes Computing announced CPM for the Qbus and Unibus, and several "fourth generation" languages were featured.

Among the more glamorous peripherals displayed were Kode's new handprint recognition device, that accommodates paper forms even when they are placed on the device skewed.

Plessey Peripheral Systems, which is moving into support and service for DEC and DEC-compatible systems, provided entertainment with its new voice recognition unit, where visitors were encouraged to play Pacman entirely by speaking commands into a microphone.

Wynnd would not reveal the extent of Pactel's investment in the defunct venture, but indicated that the returns had been less than expected.

Tamsys has had more success, having used MDBS in-house. It approached the parent company MDBS and now holds the official distribution rights. The company is also taking on the Knowledge-man database and spreadsheet, a low-cost version of MDBS.

Knowledge-man, described by Tamsys technical director Alan Hare as a "baby brother" to MDBS, sells for £350.

Knowledge-man, described by Tamsys technical director Alan Hare as a "baby brother" to MDBS, sells for £350.

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## DEC's Vax machines get a disc link

SYSTEMS Industries, leading disc and storage system supplier for Digital Equipment and Data General minicomputers, has launched a multi-access control system to link DEC's Vax machines.

Following hard on the heels of DEC's own announcement of Vaxcluster, its system to link Vax minicomputers using its Computer Interconnect architecture, Systems Industries offers Vax users its 9930 Simacs, which is based around a 9900 disc controller.

Simacs offers Vax users common storage for up to eight local CPUs, and is both Vax hardware and VMS software compatible.

"The systems manager will now be able to get some sleep at night", said Colin Smith, the company's European software manager. "Simacs offers enhanced peripheral usage, load balancing capability and user transportability."

"The difference between Simacs and Vaxcluster is that we link at the disc controller level rather than at the Vax level. If a Vax goes down under either system, discs will remain live, but with Simacs,



SMITH... "Managers can sleep."

channels will not be degraded," he added. Vaxcluster does not support 11/730 machines whereas Simacs does.

Meanwhile, DEC has announced its first order for Vaxcluster. It is being installed to link four Vax 11/780 minicomputers at the Water Research Centre in Swindon. The cost of linking the four under Vaxcluster is estimated to be in the region of £40,000.

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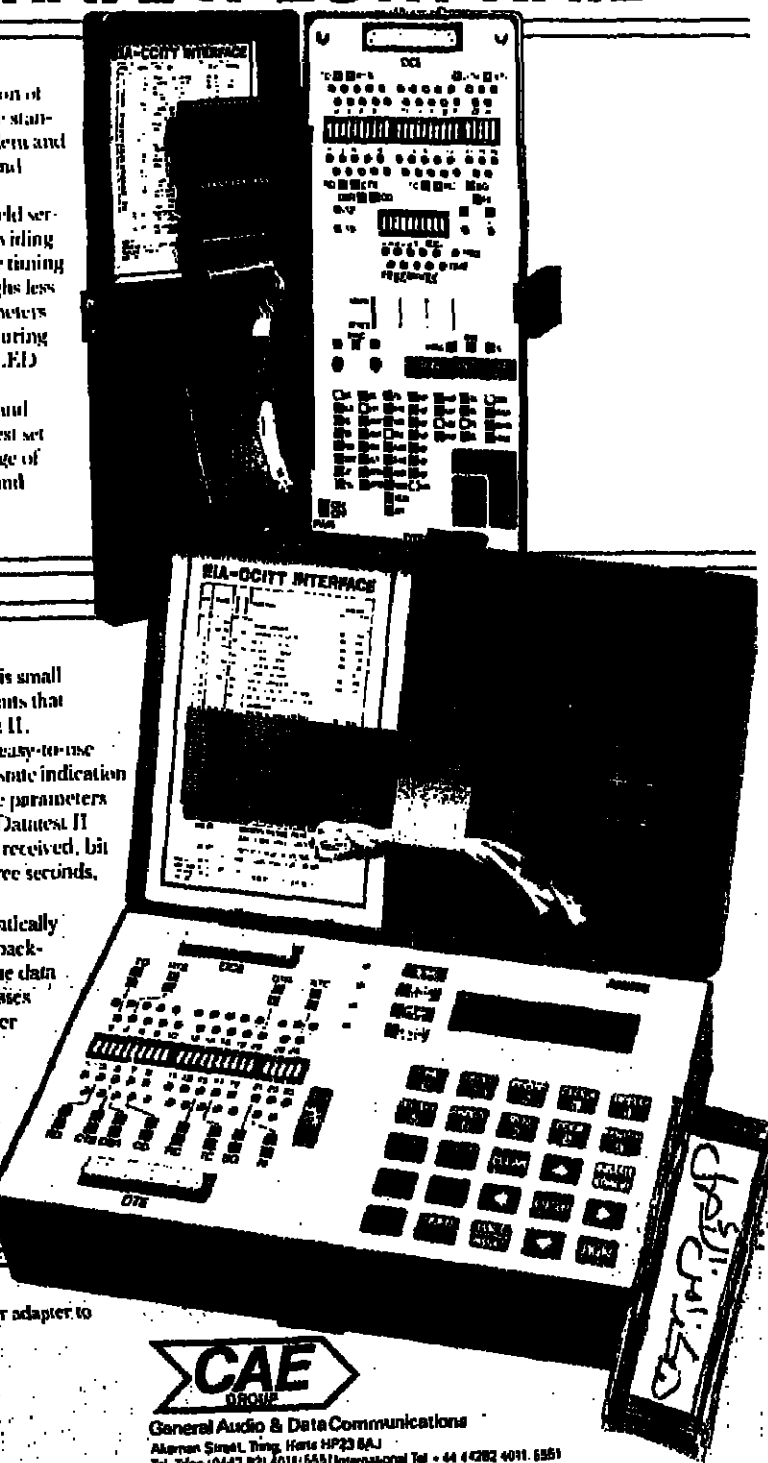
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# Take your pick of generators

by Claire Gooding

THE newly-fired Pick software industry is offering UK users a choice of custom-generated applications.

Two new systems generators from UK Pick houses have come on the market - The Programmer System from Fletcher Computer Services, and the Database Generator from British Tyre and Rubber subsidiary RealTime Business Systems (RTBS).

While RTBS' Database Generator is home-grown, Fletcher's system comes from Denver-based Pick house, The Software Group. They run on any machine supporting Pick, including the General Automation Zebra, and the well-established Pick machines like CMC Reality, Ultimate and IBM Series 1.

It is unusual among Pick systems generators in that it produces not the standard relational database files, but Dan Basic source code, so that the code it generates can be amended by hand or supplemented by the company's own modules.

Like other generators it works through screen painting, building files and dictionaries via screen prompts. The generator costs £6,000 and is aimed more at DP people than end users.

## Data Logic case settled out of court

THE territorial dispute between Data Logic and Bluebird Software has now been settled out of court.

The clash began when Data Logic obtained an injunction in the High Court earlier this year to stop Bluebird trading with its clients for a week. Data Logic, the British systems house owned by US electronics giant Raytheon, had bought Altergo Ltd and Altergo Business Systems from the receiver. Bluebird had been set up by a splinter group of Altergo Business Systems senior managers shortly before the collapse of the Altergo empire in April.

This week Martin Wood, of Data Logic, said it had accepted the court's judgment and would not appeal.

But Bluebird managing director Brian Walker claimed it had been a climbdown by Data Logic. He said Data Logic had paid their legal costs as well as damage for loss of earnings.

## Oil rig system

BP SYSTEMS subsidiary Sicon has developed a new method for supervising staff movements on North Sea oil platforms. The system, based on DEC Vax minis at Aberdeen, has been installed on BP's Forties, Magnus and Buchan fields and could be sold to other oil companies. It uses a ruggedised badge reader at various points on the rigs to feed back data to the central unit.

## Post project

CAP has won a £100,000 contract to develop software for the Post Office electronic post project. CAP's London Industrial branch will write the programs for use in six regional sites. The scheme, being undertaken on a Hewlett-Packard HP3000 mini, aims to let users send details of mailing requests to Post Office on magnetic tape.

## Prism puts programs into chain stores

TOP Sinclair distributor Prism Micro Products, which is promising a new image for software distribution, launched a new deal this week with Rumbelow's electrical chain stores.

Prism, which expects to show first year figures of about £9 million turnover, is to use the 238 Rumbelow shops as the base for its new look software selling campaign, through about 60 salesmen.

The aim is to make the products look attractive to buyers, as records or tapes do in a shop window.

"Up to now software has been stuck behind a glass cabinet and hasn't attracted attention," said managing director Bob Denton.

The Database Generator is aimed specifically at large users. RealTime Business Systems has already produced several large and intricate systems for its parent using the tool. The applications areas in which RTBS has used the generator include management and project control.

The £6,000 Database Generator, said to be completely portable, has been picked by General Automation to be the standard applications generator for its Zebra, which runs Pick as well as MS-DOS and Xenix.

Other tools in the suite with Database Generator include an auditing package, systems security, project management, management modelling, and operations management.

"We've used the system to create a management package for British Tyre and Rubber of over 1,100 programs," said Rosemary Chester, RTBS marketing manager. "It reduces programming costs considerably."

According to director of marketing, Geoffrey Duckney, the product's strength is that it can build complex integrated systems or, at a lower level, be used for prototyping and standalone system generation.

## Management tool for UK

ASHTON-TATE, US owner of micro database manager dBase 11, is bringing to the UK its fast-rising Financial Planner, formerly known as FPL, the financial planning language.

The software has jumped to eighth place in the US league of management tools topped by Visicalc and Multiplan. It was written by Dennis Brown, who has extensively revised the system since joining the staff of Ashton-Tate in California. Users include Renault, 20th Century Fox, Hughes Aircraft and Citibank.

Product manager Skye Quin said in London that the software was to be enhanced from September with graphics for all machines. The system runs on most eight-bit machines under Digital Research's CP/M operating system and on 16-bit machines, including the IBM-PC, under Microsoft's MS-DOS operating system.

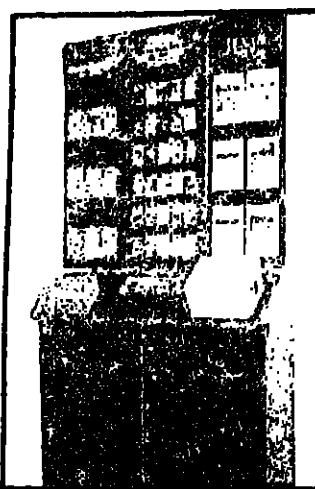
Quin sees flexibility as the main feature contributing to the Financial Planner's rapid expansion in the US since it was introduced there last year.

## Ship-shape

FERRANTI has delivered the first of its new CACS1 (computer-assisted command system 1) systems to HMS Boxer which is being built at Glasgow. It co-ordinates data from sonar, radar and other electronic equipment with the ship's weapons. CACS1 incorporates two of Ferranti's FM1600E machines, 12 Argus M700 minis and several P100-L microprocessors.

## Business launch

SOFTWARE house TABS of Andover has launched its new business suite, BasITABS, aimed at first-time users, which runs on IBM-PC, Sirius, Apple II, BBC, Osborne and CP/M operating system-based micros.



A Prism point-of-sale unit.

## Root's Unix map is sold for the first time

UNIX specialist Root Computers has made the first sale of its ROOTmap "friendly front-end" to the operating system - 250 copies to Sphinx of Maidenhead.

The new software publishing company, set up by ex-Zilog marketing manager Pamela Geisler, has also bought a number of copies of ROOTLink, the SWURCC (South West Universities) Pascal connector, as well as ROOTeam, the utilities library, and ROOT-pay, a payroll package from Computerhouse of Newcastle. This brings the value of the order to £42,000.

Root managing director Robin Schlee sees it as the first step in the effort to market a set of Unix tools and applications, both developed

in-house and bought from other software houses.

Root has put most of its energies into devising applications to promote Unix as the standard 16-bit system, since the National Water Council invested £200,000 into the company last year.

Schlee aims to persuade hardware manufacturers, especially of the Motorola 68000-chip micros to bundle ROOTmap as part of the product offered to users.

Under a legal agreement with Unisoft of Berkeley, California, Root is collaborating on the promotion of the Uniplus+ implementation of Unix System III, which is now ported to more than 40 68000-based machines.



PROWD... "Main feature is human engineering."

## Pearl dons a new 16-bit guise

by Claire Gooding  
APPLICATIONS generator Personal Pearl is to make its appearance in 16-bit version, available this month in the UK. The new version of Pearl is one step in a series of developments planned by Pearl's originator, Relational Systems.

These include a Business Pearl, planned for release in November, which will increase the number of files that Pearl's relational database is capable of handling above the present limit of 10.

Personal Pearl 16 will increase the number of files that Pearl's relational database can handle simultaneously from the present limit of five to 10 files. Business Basic, planned for release in November, will increase the number still further, and make it possible

to integrate files so that updates are automatic. In the New Year Pearl International, the UK's exclusive distributor for Pearl, plans to bring Corporate Pearl to the UK. This version of the applications generator will make it possible for end users to download data by linking with company mainframes, and it is planned to run Pearl for minicomputers for the first time.

Personal Pearl was one of the first applications generators to be taken seriously, appearing in its first form, a generating tool for programmers, over four years ago. Since then the product has been developed to include relational facilities, and the comprehensive end-user features which transformed the product into Personal Pearl.

Like most applications generators it works by getting users to build their own data files. The outstanding feature of Pearl is the thoroughness of the end user interface, which gives prompts and full help facilities, and also fills in many items automatically by relating new items to information already entered by the user. The files it builds can be used by other software, or built upon to create specific applications.

RSI has solved the worst problem Pearl had, the fact that it was slow, by rewriting the Personal Pearl 16 version in MT Pascal, and further versions, written in C for the applications-hungry Unix market, are on the way.

After several false starts in the UK, Personal Pearl has taken off and Poole-based Pearl Interna-

tional is discussing deals with manufacturers including Epson.

Pearl International was set up by Tony Frowd and Chris Hibbert two years ago, when other distributorship deals foundered. Hibbert, formerly a dentist, had used Pearl to produce his own administration package for his dentistry practice, and was so impressed with the software that Hibbert and Frowd put their own money into setting up Pearl International.

"One of the strengths of Pearl in its various versions is that it is completely compatible with previous releases," explained Frowd. "The main feature is its human engineering which enables professionals with little experience of computing to build their own applications."

## Census package on sale

SASPAC, the local authorities' census statistics handling package, is being put on general sale.

The decision of LAMSAC, the local authorities' management services and computer committee, to sell it to the public could have wide implications for the expanding educational software market. Now LAMSAC is planning to join with Newcastle University to sell a version incorporating Italian census data overseas.

LAMSAC project officer Keith Dugmore said they would look open-mindedly at proposals to license new systems derived from SASPAC for educational use. So far LAMSAC has had more than 20 inquiries from potential customers, including polytechnics, computer bureaux and private companies.

"The kind of people who seem to be most interested in it are geography departments and town planners, but the possible uses of it are very diverse," said Dugmore.

SASPAC software was written by Durham, Edinburgh and Salford Universities, in conjunction with the Office of Population Census and Surveys, between 1980 and 1982, at a cost of about £130,000. By clubbing together the local authorities estimate they saved £1.2 million which they would have had to spend to develop their own systems. Now they could turn the expenditure into a capital gain. The information comprised in the small area statistics - the main output from the April 1981 census - covers some 130,000 enumeration districts.

Customers can buy data from the OPCS by district, ward or county, according to their needs. SASPAC systems are priced at £1,000 up to £4,000. At present it is installed on over 150 mainframes and minis of 14 manufacturers.

According to Boothroyd, losing Microsoft coincided with a dramatic increase in business from Digital, so the effect on turnover was not dramatic. "We are very content with things as they are," he said. Half of Vector's £2.6 million revenue comes from software products, and the remainder from micro engineering interests.

## Star will sell Delta

THE Delta database from Composit is to be sold with the Star Personal Computer as part of the Star Computer Group's partnership scheme. The product will be sold by accountancy firms dealing with Star.

The deal between Composit and Star makes Delta into a DEM product in Star's own packaging, with support and training from Composit.

Star sales manager of Personal Computer Division, Malcolm Cornish, said: "The high level of support and the training were important to us because we will be selling Delta through our partnership scheme."

Accountants who are part of Star's scheme will get Delta at a 20% discount.

Software File is compiled by George Black

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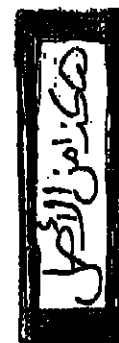
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# Apple brims with confidence as IBM sets threat

Jack Gee visits Philip Roybal, Apple's product marketing manager, Europe, to see how his company is reacting to the arrival of the IBM Personal Computer on the market

APPLE Computer is confident it can maintain its market share against IBM's challenge and predicts success for a revamped version of the Apple III and for the controversial new Lisa, in spite of widely shared doubts within the industry about prospects for both models.

Philip Roybal, Apple's product marketing manager, Europe, says the company expects its market to grow by over 50% this year, compared with about 45% for overall sales of microcomputers by all manufacturers.

At his headquarters in Neuilly

on the outskirts of Paris, 36-year-old Roybal says: "Last year Apple's share of the personal computer market grew by 70%. The entire market expanded by between 45% and 50%. This is not the way we are going to lose market share to IBM or to anybody else."

"In the United States we have penetrated only about 5% of the market, in Europe about 1% and virtually nothing in the Third World countries."

"If nobody else were there to share the market with us, it would not grow so fast. The arrival of

IBM with its Personal Computer is helping to sell more Apples. Our market is growing larger just because IBM is there."

"We don't expect IBM to have a greater slice of European sales than Apple any time soon — maybe ever!"

Roybal says he is confident that the educational market, which represents 25% of Apple sales in the US, will develop just as strongly in Europe.

But France has been ensuring that school orders for micros go to small French manufacturers such as Goupil and Leandord and in Britain the Acorn has benefited from the BBC's exclusive backing, he complains.

"Governments tend to subsidise home-grown products," says Roybal. "In England it is much easier for a school to buy a BBC Acorn than an Apple 2. One of our challenges is to find out how to work with European governments so they achieve their aim to create jobs and improve exports while we achieve our own — to sell more Apples."

Apple's ambition in Britain, according to its European sales chief, is to build up deliveries to a level that would justify opening a factory here. At present Cork, Ireland, is the site of its only European plant. All other manufacturing is done at Cupertino in California, Dallas in Texas and Singapore.

Roybal says: "Britain at present has the lowest growth rate for Apple sales. In other countries in Europe our sales are pacing those of the corporation as a whole. Until two years ago, Britain was one of our strongest sales bases. But when we had satisfied the hobby market, sales levelled off."

However, now the business market is beginning to respond, Apple is more optimistic about the outlook in Britain, particularly as the British economy shows signs of joining the US in emerging from the recession.

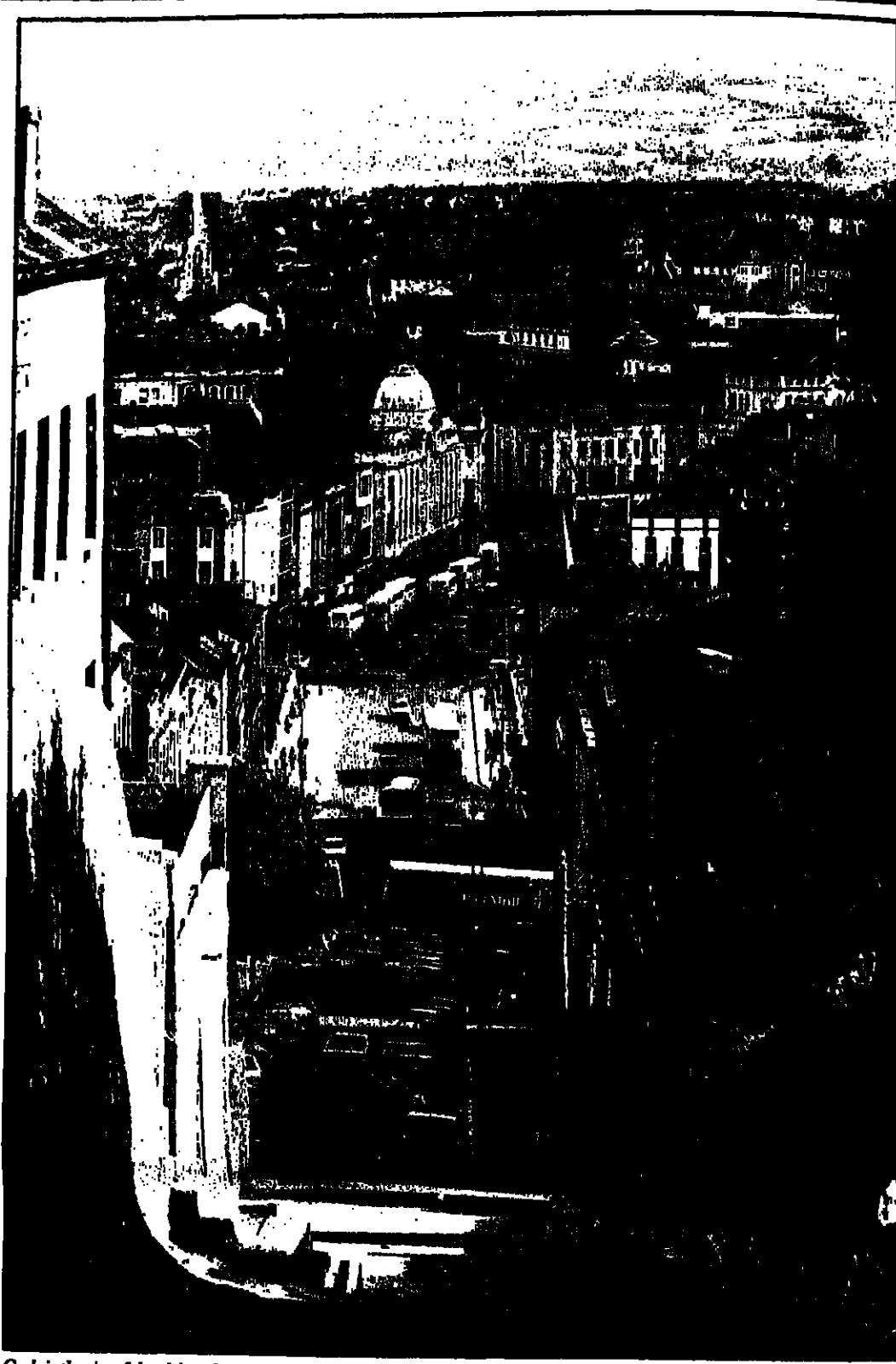
"Britain is a country where the market understands the computer," Roybal comments.

Like his fellow Apple executives in California, the European marketing manager is reluctant to reveal the firm's plans for the Macintosh, a smaller version of the new user-friendly Lisa and designed for university students.

Says Roybal: "Macintosh is just one of many projects on the drawing boards and in the labs at Apple. We don't have a date for launching it or even a price."

He suggests that Drexel University in Philadelphia, which has been reported to be the first future customer for the Macintosh, may get something else instead. "The machine sold to Drexel will specifically meet the university's needs. It will not necessarily be a Macintosh — perhaps Macintosh might not be ready for the freshmen students who have to be equipped early next year."

But Roybal predicts that Drexel's microcomputer might soon be launched on university campuses in Britain and elsewhere in Europe. "When I went to college as an engineer, you had to have a slide rule," he recalls. "Today you need a personal computer, whether you are majoring as an engineer, journalist or in the liberal arts."



Cork is the site of Apple's only European plant, though the company hopes eventually to build a factory in the UK.

Roybal claims that Apple will not get involved in the price-cutting war which has wreaked serious damage at Texas Instruments. "There is a limit below which it is more profitable for a company to make a more capable machine than a cheaper machine," he argues.

"Our principal cost element is the semiconductor. Each year the industry figures out how to pack twice as much material on to the same size chip. That is why our manufacturing costs — and our prices — are going down."

Roybal expresses confidence in the future of Lisa in spite of delay in its mass market release following a series of public presentations at the beginning of this year. He also brushes off the suggestion that Lisa is overpriced.

"I'm sure we shall be on target for selling 10,000 Lisas this year. Lisa's European price (about \$12,000 — somewhat more than in the US) is one-quarter of the price of the Porsche Tiger, and there is no shortage of buyers for those cars."

"Price does not matter. What counts is whether the customer thinks he is getting value for money. If a Lisa can make a company president or top manager better as a decision maker, it pays for itself in a single day. That's the kind of person for whom Lisa makes sense."

Roybal claims that the key advantage of Lisa over rival products, particularly the Xerox Star which is based on a similar technology and has been developed in a parallel venture, is not the "mouse" pointer device but its graphics performance.

He dismisses predictions by American computer analysts that Apple III faces doom following

disappointing sales in the US in spite of a 30% price cut.

"If we were to make only the Apple III and nothing else," says Roybal, "we would still be the sixth biggest company in the computer business. So it is difficult to say that Apple III is not worth the effort."

"If Apple IIIs are not selling as fast as some people might wish, it is because we have a lower-end alternative with the Apple 2E. I have an Apple III in my office here in France because I want its capacity, memory and speed."

**"In each country we shall beef up our marketing staff by 50% over the coming year"**

"Sure, it's not going to sell as well as an Apple 2, because not everybody needs an Apple III. But it certainly sells well enough for us to be happy to make the product."

Roybal reports that the company is now working on an enhanced version of the Apple III. "We are not ready to announce it yet, but we are making good progress. Costs have come down, better chips are available and we have got ideas from other products which will help Apple III."

"IBM is our most serious competitor," he adds. "But IBM is not the real competition for Apple. That comes from people's traditional ways of doing things. We have to win them over to the computer."

"Our job at Apple is to make our products as easy to use as we can and to educate people to realise that, if we do that well, it does not

matter who else is in the business."

Another major advantage claimed by Apple lies in productivity. Roybal says the firm has turned over \$200,000 for each employee annually since 1979 and aims for a higher figure in 1983.

"That's 10 times the productivity of National Semiconductor and twice that of IBM," he claims. "One of the reasons is that every one of our people has an Apple 2 at home. He lives with it all the time and gets it free as soon as he joins the corporation."

Roybal prophesies that the recent top management changes at Apple will make for a more co-ordinated approach to marketing. "Floyd Kwamme, executive vice-president for marketing and sales, has the job of ending the dispersion of Apple's marketing effort. What Kwamme brings to the party is his ability to get the marketing back together."

"John Scully, the new president of Apple Computer, has a good understanding of how to run a big business which he has brought to us from Pepsi-Cola."

The marketing shake-up at Apple under the new top management will affect Europe too. Michael Spindler has taken over as executive vice-president and general manager, Europe, from Ken Zerbe who now assumes global responsibility for Apple's marketing efforts.

"I think we have pretty good general managers in each European country," says Roybal. "France has the strongest overall organisation. But in each country we shall beef up our marketing staffs by 50% over the coming year. Apple faces a great future in Europe and we want to be ready for it."

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## PROFILE

## Hecht is on the celebrity road



HECHT... In the expert market.

NO company in the infant market for expert systems can match the credentials of Lee Hecht's fast-expanding US outfit Teknowledge.

At heck and call are 25 celebrity consultants including the well-known artificial intelligence guru Ed Feigenbaum who had a hand in the launch of the company, and Gordon Bell, vice-president of Digital Equipment, the world's number two computer company.

And it would be a fool that would bet against the company's president Lee Hecht himself becoming a computer celebrity within the next year or two.

He was the one who persuaded the French \$1,000 million nuclear engineering giant, Framatome, that it would be a good idea to put up \$1.8 million to start a joint European venture to market knowledge engineering products.

The ingenious aspect of the deal from Hecht's point of view is that Teknowledge has not paid a cent to form the jointly owned new company, called Framatec. Instead it is providing its expertise, deemed worth \$1.8 million.

Framatec, based in Monaco, has a market value of \$3.6 million, making it on paper bigger than Teknowledge itself, which last year turned over \$700,000.

It will not be long before Framatec poaches business in the UK, in particular from SPL International, which dominates the domestic market with its expert system Sage.

by Philip Hunter

The expert systems developed by SPL, Teknowledge and others have two aspects: a knowledge base specific to the particular application, typically medical diagnosis or oil exploration, and an inference program independent of the application to draw conclusions from the base for a particular case.

The knowledge base contains a set of rules, or key facts, based on consultations with human experts in the field for which the system is being developed. Sage has already been tailored in the UK to a number of applications.

One is political risk analysis for the Shell oil group, designed to advise on the wisdom of drilling for oil in politically unstable countries. In this case there might not be a common consensus on the form of the rule base.

Hecht says his expert system is in essence quite like Sage. "In concept, the product we are building for the next year has the same orientation as Sage," he says. "But ours is more for the heavy-duty market."

## 10 YEARS AGO

FROM COMPUTER WEEKLY OF JULY 3, 1973: The BBC ordered a 6400 ADX message switching system from STC for installation at Bush House, London, for managing the distribution of a single piece of information to some 35 world services. Control Data UK established a

wholly owned subsidiary, Control Data Nigeria, in the oil-rich African republic. It was reported that Britain's "Yes" vote in the Common Market referendum had cheered the many Continental companies which looked to the UK for a proportion of their computer personnel.

## PLATFORM

## How DP managers bring order to chaos

IN two decades a considerable amount of engineering has been invested in the modern information processing system.

But there is a group of people which hasn't taken the power of the information processing system for granted. That group consists of DP professionals, the high priests of the profession whose strategic position within their companies has given rise to new organisations shaped around the computer: the application development centre, the mainframe information centre, and now the personal information centre.

Everyone is talking about the application centre and the information centre, two new forms of allocating processing resources. These attempts at servicing end users with the latest technology have created an uncomfortable situation. Pressure on the data processing professional is becoming intolerable, and I offer these related ideas which may help reduce the pressure.

While it is somewhat popular today to view the data processing professional as hostile to change and, more specifically, to end user needs, he in fact has been, and is a primary agent of timely corporate progress and change.

So that real progress be made in a consistent and safe manner, sound, basic engineering principles are the guidelines the data processing professional uses in developing and analysing technology for use in application development centres and information centres.

An organisation's application of DP technology shapes its competitive response to market opportunities. It is my belief that organisations that effectively use their information in a timely, accurate, relevant and secure manner will emerge as leaders in their respective fields.

Timely progress and the incorporation of sound engineering principles in application development are two items seemingly in conflict. They are not. The data processing manager reconciles these apparent conflicts.

The key to a corporation's future success will be the ability for more and more decision makers to access corporate information. The race is on throughout the world to use the latest technologies to accomplish that better than your competitor.

Your MIS (Management Information Services) department's response to new technologies affects your corporation's ability to

respond to that competition. Many of us know that the approach the DP professional takes in providing information shapes the thinking of an organisation.

Data processing does so by using available technology to direct how, when and under what circumstances information is analysed. In this manner, DP affects the decision making process of the organisation, at all levels.

DP is the driving force in your organisation. DP is that critical path to organisational success or failure.

Data processing as a strategic element in the corporation, is the developer, protector and repository of corporate information resources. As third generation hardware and software has become more versatile, the concept of management

characterised by an ability for each individual personal computer user to selectively draw upon pieces of today's production database as needed, and in the format that the user wants it.

Many a DP manager has characterised the overall situation as chaos. An unbelievable number and variety of software tools and systems are being offered in every end of the data processing spectrum.

But upper management does not comprehend that the continuing technology "promise" in data processing goes many times unfulfilled. It needs careful implementation with quality, strategic software and hardware. The only one that seems to be concerned about relevancy, accuracy and security, in addition to availability, is the data processing manager. Fortunately, this much maligned DP manager understands this world all too well. He looks for the right solution for the long term.

Strategic software is not inexpensive, nor is it easy to develop, nor easy to recognise. It must be durable, maintainable and - a new word - extensible: extensibility in software means the system grows and adapts over time to encompass ever expanding needs and environments without disruption.

These qualities are arrived at through a process known as software engineering. It is necessary to apply this discipline to DP areas that are critical.

With virtually thousands of software offerings, how does the DP professional recognise strategic, engineered software?

It's done by closely investigating the vendor. How does he view software engineering? What processes are used? How extensible, maintainable and durable have his products been? What do his users say?

In our experience, DP professionals agree on some common elements of software engineering. They are: hard-nosed quality control; extensible architecture; strict specifications for reliability and durability; intensive research; disciplined development process; organisational control; and company strength.

In this confusing, fast paced, competitive world, data processing is more strategic than ever. The data processing professional brings technological order to a chaotic world through application of basic engineering principles.

Contract workers would have to reveal their qualifications and pay to the permanent staff of installations in which they were working, and be subject to legally limited contracts. Client companies would be liable for their wages if the contract firm went out of business, and agencies would have to reveal their fees among other limitations.

There are two approaches that the DP industry can take. One is to do nothing, let it go through the European Parliament for its opinion, and on to the Commission to recommend the proposal in secret and rely on it when it comes before the Council of Ministers. This would put the proposal on ice.

The other approach is to protest cogently and vigorously to the European Commission, to Euro MPs, to the press and to national MPs and government, and push for amendments. If controversial a proposed directive such as this can take years to go through all the stages. However, they must always be taken seriously.

1984 and all that... This year's example of the strange things people say about computers was sent in by Priscilla Rattenbury of Abingdon, Oxon.

Computing hardware has become so cheap that it is impossible to find staff to run on it... The Guardian



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Computing hardware has become so cheap that it is impossible to find staff to run on it... The Guardian

## ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, July 7, 1983

## Bless the £5 million, but give them more

FIRST signs from the newly-merged Department of Trade and Industry are not too bad. At least the merger has not dried up the trickle of money into the "sunrise" computer industry - though whether it will be able to stem the flood of money into the sunset heavy industries and divert it towards new technology remains to be seen.

A mere £5 million for database development will not of itself do a lot of good - but if it turns out to be just an indication of good faith with more to follow for deserving parties then we are moving in the right direction.

It seems that the voice of Ken Baker is still being listened to, even if he failed to achieve elevation to the Cabinet in the last reshuffle.

Let us hope that his boss Cecil Parkinson was among those who read his message: "If we turn aside from these opportunities and allow our overseas competitors to take the lead, the future of our country is bleak."

The knightship awarded to Clive Sinclair is a sign that there are people at the top who take this viewpoint seriously and realise how completely our future depends on winning this race.

But the winning of the race in turn depends upon a collective effort.

A Battle of Britain approach, which leaves us owing so much to so few, is doomed to failure. Government backing is needed to get as many involved in the enterprise as possible.

IT year 82 gave a lead with funding for hardware and software ventures and Baker promised that December 31 would not see the curtain coming down. The database initiative is a logical continuation of IT 82 to pave the way for services which can make Britain the world information centre.

The project deserves our blessing - and more government money.

## Protest about this new Euro proposal

THE European Commission took action this time last year to prevent the exploitation of temporary workers within Europe, particularly within declining industries against the backdrop of recession.

The proposed directive that it published has caused an outcry in the DP industry, which on the whole is an expanding industry, where job-hopping is commonplace, and where people elect to leave permanent positions for better paid contract working.

Client companies benefit by employing trouble-shooters or extra staff only when they are needed and the computer service agencies benefit by acting as go-betweens.

The proposal, which was influenced by European trade unions, aims at equality of benefits, pay and facilities for temporary workers. Viewed from the perspective of the DP industry, the resulting proposals are unnecessary and suffocating.

Contract workers would have to reveal their qualifications and pay to the permanent staff of installations in which they were working, and be subject to legally limited contracts. Client companies would be liable for their wages if the contract firm went out of business, and agencies would have to reveal their fees among other limitations.

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## LETTERS

## Vision of lifestyles after the IT revolution

ROGER GRAHAM's vision of post-IT revolutionary life (Platform, Computer Weekly, June 23) is credible up to a point, but begs too many questions to be satisfactory. Perhaps the full text of his lecture might have answered some of them.

First, there is an implication that all IT developments are, *per se*, desirable, or at least "ecologically and environmentally positive". I am more than a bit worried about creating an environment in which:

(a) The home based lifestyle, with a reduction in such communal activities as workplace, shop,

library or cinema-attending further stunts the social nature of man (and by default encourages the anti-social).

(b) Information, especially as disseminated through education and the media, takes on a false cloak of objectivity brought about by the technology which conveys it (a computer, like a camera, never lies), and therefore becomes less open to challenge and to criticism;

(c) Big Brother exists. There is productivity and profit to be made out of IT but can unfettered capital be trusted to look after society's best interests?

Secondly, he sees a development

towards two lifestyles: one highly-paid, fully-employed, secure, the other based on non-paid work, DIY and flexibility.

Left to the market forces that govern our economic and social life currently, is there any hope that this will be anything other than Hobson's Choice, to be in work and busy, or out of work and bored?

There is little or no profit in supplying the needs, let alone the luxuries, of those four million currently in a "non-paid work environment" and we can really expect enough small businesses to

persuade investors of their profitability to be able to employ these millions?

The prerequisites for Graham's society are surely:

(a) A realistic national minimum income to replace the dole and social security.

(b) public control of the economy to guarantee the provision of ever-increasing and socially necessary services, and to provide occupation (whether productive in today's terms or not) for those who find themselves living a non-paid-work lifestyle.

R. HUGH PIERCE

London SE7

## Sick pay legal obligations

I PRESUME that Mr Dillaway (Computer Weekly, June 16) is not suggesting that employers either turn a blind eye to the legal obligations imposed on them under the SSHB Act 1982 or quite simply make it financially attractive for employees to be away from work.

Our concern with the legal requirements of the legislation is not for some esoteric reason. The end result of SSP operation is in an employee's pay packet and, while we agree with Mr Dillaway that final offsetting is a payroll responsibility, this can only be done if the SSP system forwards to payroll the daily amount of SSP entitlement and identifies the day for which it is due.

The danger is that employers may recover SSP without paying it, in contravention of Section 9 of the Act - which quite reasonably states that the employer may lawfully recover only what he has paid out by way of SSP.

Mr Dillaway is obviously not in contact with the trade union movement, which is receiving a daily barrage of queries on SSP from its members.

A special trade union conference held on May 24, attended by delegates from the AUEW, GMBU, APEX and the NGA, identified important areas of concern about the operation of SSP and the restrictions imposed by rigid qualifying day agreements and offsetting limitations.

I believe that the autumn will see considerable pressure by the trade union movement for an increase in sick pay benefits to compensate for the deficiencies in employers' operation of SSP.

M. D. COPELSTON  
Information Management  
Services  
Exeter.

## Vulnerable employers

I REFER to the letters from Messrs Dillaway and Copleston, sitting cheek by jowl (Computer Weekly, June 16). Dillaway asserts that "failure to offset breaks no laws". Copleston invokes a specific rule in schedule 2.2 of the main law. This, he tells, requires day-to-day offsetting. Who is correct?

Copleston wins, hands down. Day-by-day offsetting is specifically required by law in order to:

(a) Preserve the reality of three waiting days during which the employer may but the State generally will not provide financial support to the sick employee;

(b) Guard against certain collusion or fraudulent arrangements;

(c) Accord an advantageous negotiating position to the employer in respect of collective agreements which must be re-negotiated.

Dillaway, entrapped in a payroll and reclaim perspective, clearly does not understand these considerations. If an employer offsets two days of SSP against, say, five days of SSP paid at £4 per day, and the first three days when SSP was payable were waiting days, he could break the law. His employees, denied his legal entitlement, could have recourse to the enforcement machinery under the legislation. This leads from the DHSS and tribunals right into the general legal system. The employer would also be vulnerable to prosecution under the provisions.

BOWERS EGAN  
Edinburgh

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

## Ericsson share issue

IN an otherwise factual report, your coverage of the Ericsson Group share issue (Computer Weekly, June 16) referred in error to a relaunch of Datasah. To the contrary, Ericsson Information Systems has been actively merging and developing the various products acquired with that company since the beginning of 1982.

Evidence of this is our new Series 2000 range of integrated information systems, launched in the UK last month, and one of the first of the new company's products.

As part of our total office environment strategy you should be aware of the acquisition of Facit-Addo at the beginning of this year. The integration of that operation into Ericsson Information Systems makes us the only major supplier of office technology products to

address all aspects of the modern office. This ranges from communications (PABX, Etipax/Etipimil, modems) through data processing (Alfaskop, Series 2000 distributed systems, Step-One micro) and on to typewriters and office furniture systems.

Our customers and staff take pride in the recent achievements of Ericsson Information Systems. This has been highlighted by the positive reception of the Series 2000 in the marketplace and the sale of the 100,000 Alfaskop multi-function terminal which was recently delivered to Hitachi in the UK.

M. J. BATESON  
Marketing director  
Ericsson Information Systems  
Birmingham

## Inmos behind closed doors

WITH regard to the article on Inmos in the US (Computer Weekly, June 9) I can only add a heartfelt sigh of relief that it is, at least for the time being, not my tax money that is being poured into such an operation, especially one that won't even discuss it with a pre-

sumably respected member of the UK Press.

One trusts that its furtiveness with the identities of internal staff is not hiding the name de Lorean. I think we should be told.

DICK BARTON

Amsterdam



TOKYO AND NOW LONDON

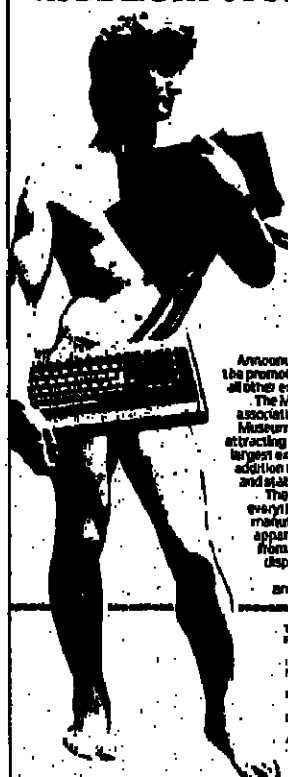
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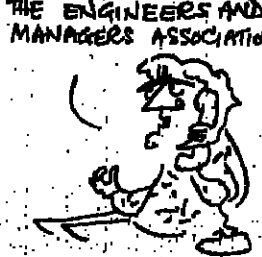
by Don

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## Step on it

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It's not programmable to a particular person's height and geometrical idiosyncrasies, but the publicity people for the Swedish makers thought it a good idea when we suggested it should be.

## Xerox gets in a breakfast pickle

THE breakfast buffet was running but much of the egg was landing on the faces of Rank Xerox executives at the company's press conference last week.

The invitation promised "an important announcement". The assembled hacks waited, breaths bated, as Michael Winkler, manager of advanced systems, took to the floor to announce the important.

But poor Winkler had nothing to say. A multi-million pound contract for Xerox micros, placed by "a leading British organisation", should have been signed the day before, but hadn't.

Winkler walked his disappointment and went back to his eggs.

Chad







## MINICOMPUTERS AND PERIPHERALS

The sixties gave us the minicomputer and the mini skirt. Judith Morris reviews the former's chances in the eighties

# Why micros and mainframes gave minis an identity crisis

BOTH DEC and Mary Quant introduced the mini in the early sixties. Both have been typecast ever since.

Since those heady days, the minicomputer manufacturers who gained renown and respectability for producing high-quality computers for science and industry which quickly began to snap at the heels of the mainframes, have found themselves with a bit of an identity crisis.

The fact is that the minicomputer has changed dramatically over the years, both in terms of size and application. The term "mini" has itself come under question. The NCC, for example, in its latest directory of hardware, chooses to categorise machines by price and memory size and ignores the terms mainframe, small business, mini and micro systems — claiming that the current proliferation of machines had made such distinctions meaningless.

And the traditional minimakers, which include DEC, Hewlett-Packard, Data General, IBM, Prime, Honeywell, Perkin-Elmer, Gould SEL, Harris and Modcomp are also undergoing a period of uncertainty.

Caught in a sandwich, with micros coming up from the bottom and superminis intruding from the top, minicomputer manufacturers have recently had to look to their laurels — a realisation which has given way to a flurry of announcements and activity as the race is on to cover themselves against changing user needs, as well as fending off the never-diminishing threat of IBM — now firmly ahead in every possible sector of the computer market.

Ten years ago the people who were buying minicomputers were, generally, the people who today are buying micros. They bought them for their low cost, adaptability to individual requirements and their multi-user functions. Before then, the applications of minis had been confined to research establishments and universities which still persist as a strong market for minicomputers.

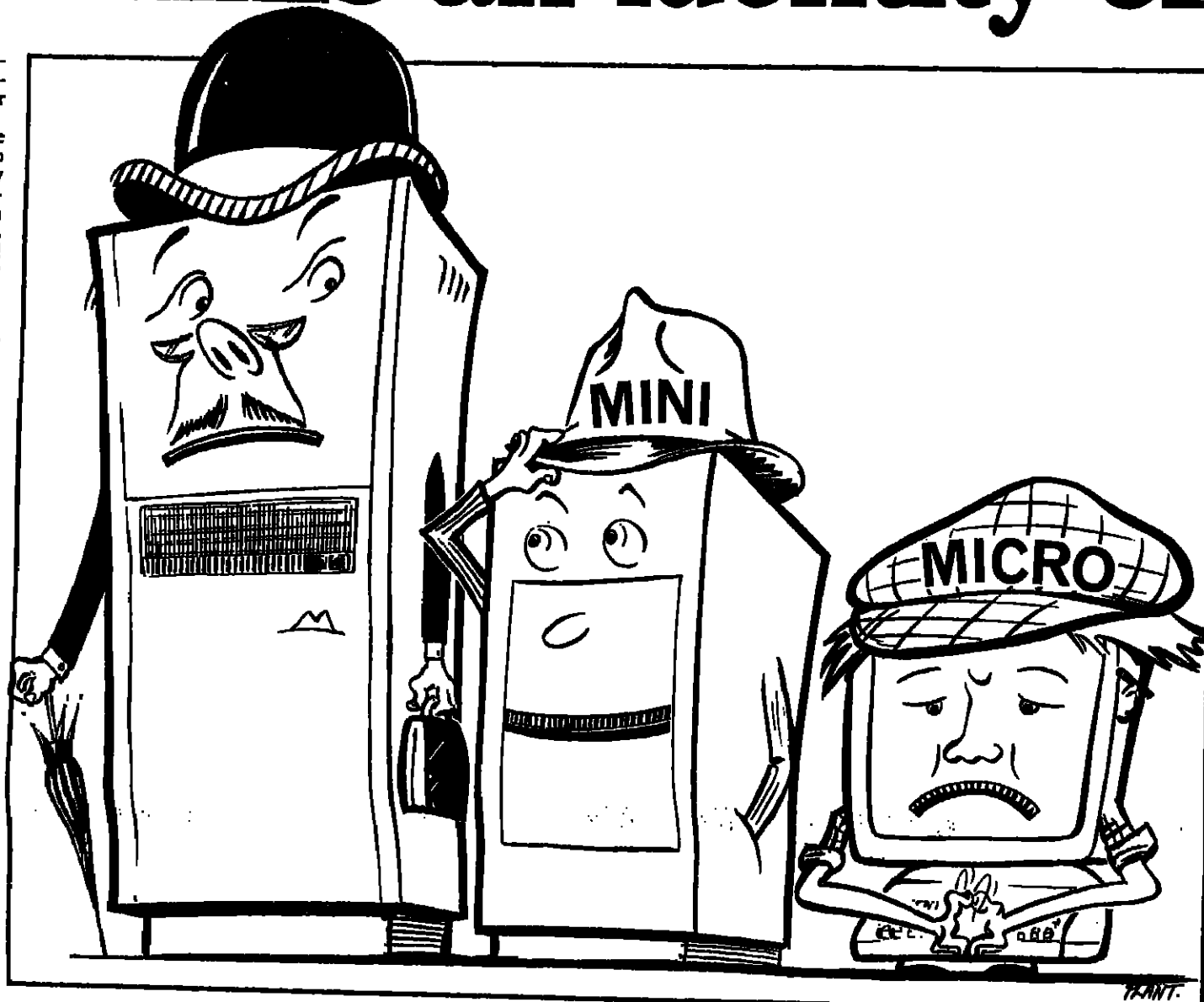
But now such a specific market is unavailable. Established minicomputer producers can no longer rely on selling one type of product for one particular sector.

"Everybody's into everything these days," said a cheerful Data General spokesman, pointing out that IBM's PC is the most successful personal computer, although two years ago nobody would have said IBM was well known for making micros.

DEC, the daddy of the mini, may be stuck with what UK marketing manager Eric Rein once described as "the stigma" of having invented the mini 20 years ago, but it certainly hasn't done the company any harm. However, DEC is covering itself against market changes and now offers a whole range of products from mainframe to micro.

Its announcements in the past two years have mirrored, if not influenced, the general trend of minimakers — extending downwards and upwards with the "supermini" and the personal computer.

DEC claims to have introduced the first mass-produced mini, the PDP-8, in 1965, seven years after it introduced the PDP-1 which had a 4K memory and 28 instructions. Since then DEC has never looked back and has become in many ways synonymous with the minicomputer, particularly because of the runaway success of the PDP-11, called "the world's most



successful popular minicomputer" and its launch of one of the first superminis.

DEC launched the PDP-11 in 1970, the same year that the company opened its first European plant and was listed on the New York Stock Exchange for the first time.

In 1977, DEC launched the Vax-11, the first 32-bit computer, and last year announced its personal computer family and its office automation programme. Its total turnover has grown from \$1 billion in 1977 to \$3.9 billion last year, and it is the only company to possibly rival IBM worldwide.

This year DEC celebrates its 25th anniversary. Last year it went both up and down with its much-publicised Vax supermini range. The Vax 11-782 dual-processor, claimed to be the industry's most powerful mini, is at the top of the company's 32-bit range and offers an alternative to mainframe power for around £300,000.

At the other end of the scale, DEC announced two new PDP-11 systems, the PDP-11/23+, and a compact general purpose system for OEMs called Micro/PDP-11 which sells for only £6,750.

The most recent additions to DEC's range are four "business-oriented" personal computers, the Professional 325 and 350, and the Rainbow 100 and the Decmate II word processor.

This diversifying of interests is not peculiar to DEC. Ask any major minikomputer where they are going and they will say everywhere. But the key word presently in vogue is "serious", a word which seeks to differentiate between companies with the majesty of DEC and late arrivals on the scene who are churning out cheap and cheerful computer systems.

It also helps the minicomputer manufacturers charge a lot more for their wares.

For minis to continue to have any impact on a changing market, it is not sufficient for the companies to cover themselves by bringing out micros and/or becoming

heavily involved with the supermini range. They must also target themselves at particular markets which are not catered for to any large extent by small business systems. Office automation, CAD/CAM and distributed business systems are just a few of the areas minicomputer companies are now addressing; and the success they have in those areas signals their chances of survival in a changing marketplace.

Prime, in particular, has thrown itself so wholeheartedly into CAD/CAM that if the bottom falls out of that particular market — as many say it will — the US

minimaker may well find itself in lumber. DEC, although traditionally weak in that area, now claims to control 28% of the world CAD/CAM market.

Ironically, when Prime purchased UK CAD/CAM specialist Compedia it acquired a DEC mini which the UK firm had been using, and which Prime is now wondering where to put.

The company also prides itself on being strong in the communications field, with various RJ2 protocols for other manufacturers such as ICL, IBM, Univac and IBM 3270 I/O protocols, X.25 HDLC networking and local area networks.

Most minimakers are finding the need to embrace the local area network. Minis now provide interfaces to the surviving networks for office automation and other business-based applications — vital to the needs of today's sophisticated user.

One of the main challenges minicomputer manufacturers are having to face is how quickly they can get into distributed office systems along the lines of those offered by firms such as Data-point, and of course, IBM. IBM chases the minis more aggressively than any other area of the computer spectrum, mainly

because those systems are increasingly falling between two stools and IBM, with its Series 1, continues to keep a steady hold on the mid-range market. GEC Computers, which with a turnover of £30 million, is one of the smaller minimakers, sees recent changes in motive and application not as a sign that the traditional mini market is dying, but that it is diversifying.

"The fallacy that micros are replacing minis in traditional areas such as science and education is being disproven all the time," explained managing director Colin Thurston. "The fact is that people are buying them as well as, not instead of."

"Obviously, we are broadening our product range," he continued, "and we are even into micros to a certain extent in so far as we use them, and we are pushing into the supermini bracket with the GEC Series 63. We are filling the top and the bottom end. We are also moving into applications."

"Our position in the marketplace — scientific and industrial — is still the same but we are trying to produce products that will help us into other areas as well."

"We are trying to move into OEM and systems houses — in fact markets where more added value can be put on a product. But this is not a sign of the market weakening, it is a sign of its expansion."

"You have to broaden your outlook," he went on. "We are not in the personal market — although we do sell systems that are under £10,000 — but we are not in the under £2,000 range."

At the bottom of GEC's range is the GEC 4150, a 32-bit mini which the company claims can be used effectively for all applications where fast response terminal handling and communications control is required.

"Our aim is to be general purpose," said Thurston, refuting the claim that minimakers must focus on specific applications to stay in the running. "We don't aim at any particular field, we just want to produce the right product for any job. We provide basic equipment that we hope can cope with everything from traffic control to industrial uses."

One company that takes quite a different approach and is perhaps one of the few "pure" minimakers left is Harris, the Florida-based mini giant which still addresses the traditional scientific and research markets.

Frank Walters, UK general manager of Harris Systems, said that since the company established itself in this country seven years ago it has geared itself mainly towards education, laboratory work, research and consultancy. He considers that broadening the market is more a matter of outlook than of introducing many new products at the top and the bottom.

Minimakers should actually be relieved that some users are turning to micros, he claims, and the traditional uses of minicomputers are now being expanded and built on rather than abandoned or left static.

"Previously," he said, "we had large numbers of small users, and respectability was the key. In education and research, there were many people doing small bits of work on a system."

"The trend now is that fewer students and scientists are using the systems but they are getting an awful lot more out of them. Things like 4 or 3-D modelling, for example, takes up a huge amount of memory and power, and it takes people a lot longer to write the programs and work on such projects."

"Users who want to perform small straightforward tasks are moving towards micros, but in education and research, although there aren't any more users, users are actually using the minis for very complex work."

Because of this trend the minimakers are having to produce very high quality systems, which Harris is doing by improving its MIP rating and the operating systems. The trend for small users

to buy micros is actually welcomed by Harris, which sees it as a way of strengthening its own reputation for top level scientific systems.

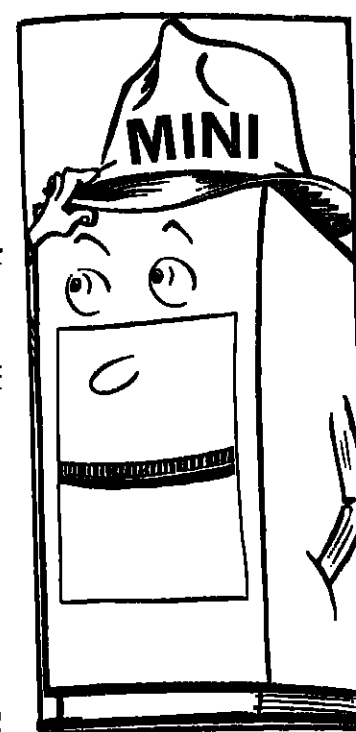
But even a company like Harris finds itself invading other areas, and once again it becomes difficult to establish where minis start and micros and mainframes end. Traditionally scientific, but chasing large ICL and IBM users, companies like these still have to have an understanding of every marketplace.

The term supermini which is now an accepted part of the computer vocabulary is in itself even becoming a bit of an anachronism, as supers get even more and more super, and most systems produced, such as each one of those made by Prime, is already 32-bit.

Needless to say every minimaker that wanted to stay in the race had to have one, and the competition was to great that Data General even had a book written about the development of its supermini, the "Eclipse".

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## MINICOMPUTERS AND PERIPHERALS



From page 20

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## Minis face an identity crisis

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customers to use it. Modcomp's traditional reputation is based on its industrial applications, notably chemical and petrochemical process control and metal smelting.

The company ran into financial difficulties three years ago before AEG-Telefunken, the West German electrical company, acquired

first 32-bit machine in 1973, when, according to UK marketing manager and supermini theorist Fred Mascarenhas, "they just weren't the fashion."

Now he claims that Perkin-Elmer's market is expanding as other minimakers realise that they too have to jump on the 32-bit bandwagon. Perkin-Elmer, however, sees

a 25% interest in Modcomp and a 75% stake in the company's West German subsidiary. The deal — which gave Modcomp a total of £30 million — meant that the US manufacturer could pay off its debts and leave it with about £20 million for investment. Modcomp now has its own 32-bit computers — the Classic range.

But the true pioneer of the 32-bit supermini, Perkin-Elmer, must surely have the last word on the subject. Perkin-Elmer brought out the

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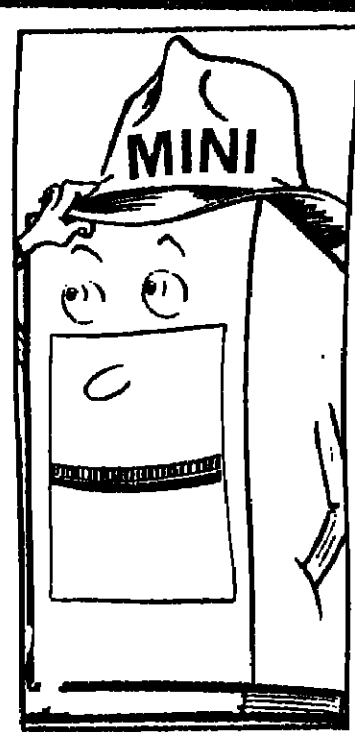
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# What makes minis scientific?

Della Bradshaw tries to find a comprehensive definition of the scientific minicomputer

SCIENTIFIC minicomputers automatically conjure up ideas of university chemistry laboratories and oil field calculations. But when you actually try to pin down what people mean by a "scientific mini", definitions tend to squirm away. As the spokesman for one minicomputer manufacturer puts it: "It really all depends on you ask." Another says pensively: "Well, it all depends what you mean by scientific."

The minicomputer manufacturers themselves produce varying definitions of what is meant by a "scientific mini". Malcolm Irwin, manager of business planning at Prime Computers, makes a first distinction: "You have to make the initial distinction between what is basically technical equipment for use in real-time tasks in laboratories, like calculating the speed of

The user would want packaged software and the use of Fortran

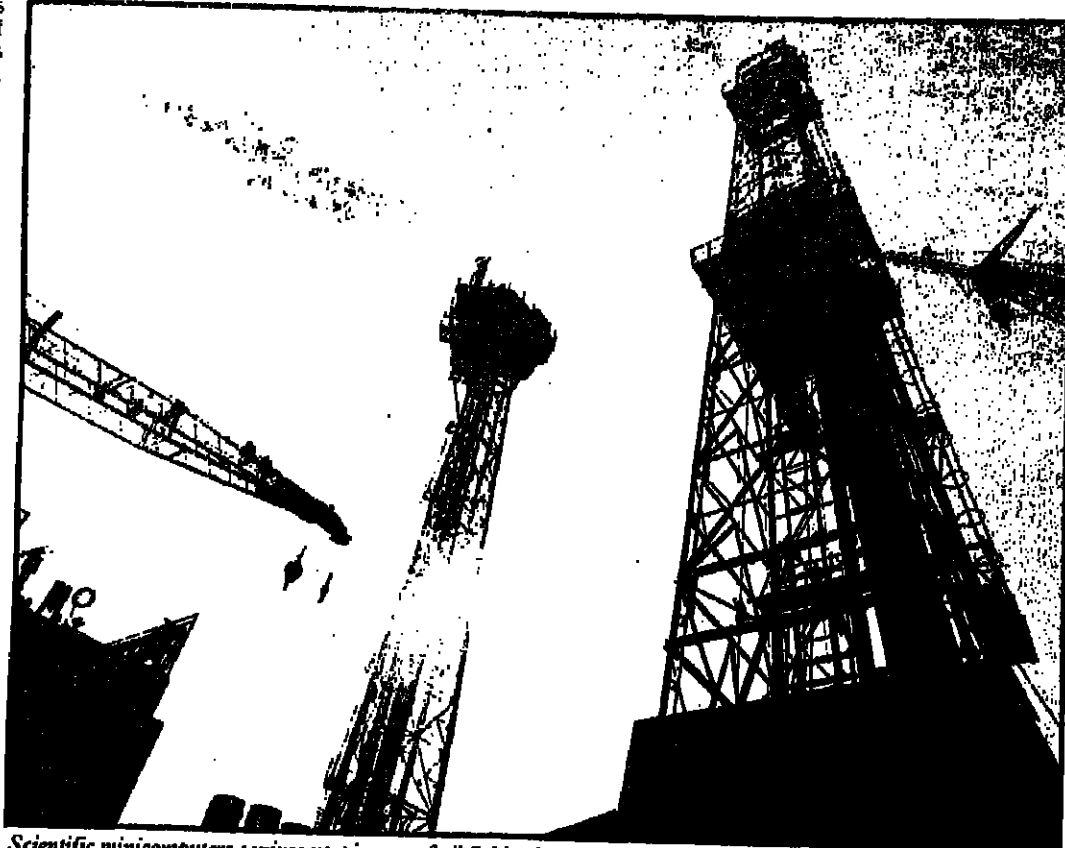
wind through a wind tunnel, and general scientific minis."

The former, according to Irwin, is usually done by microcomputers. This is backed up by ICL. A spokesman for ICL says the Perq mini is used in real-time computer-aided design situations and for graphics, and is often used as a workstation for larger minicomputers.

The basis for a general scientific mini, explains Irwin, are firstly, in scientific situations it is likely that it has to support a number of interactive users, and it has to be very quick in terms of input and output and computation.

"The other thing is that what the user buys a scientific mini for, he will not be using it for that in six months. It's not like a banking environment where you know there will always be cheque transactions, or whatever, so the machine has to be general purpose in that sense."

Irwin also claims the user would want packaged software, and the use of Fortran or other computational languages. "If the scientist is going to develop his own programs, he is going to want either Fortran or C. C has risen to fame because of the Unix operat-



Scientific minicomputers conjure up pictures of oil field calculations.

ing system, but it doesn't run exclusively on Unix.

"The Primos operating system runs C, so that is available on Prime minis."

Another manufacturer certain that Fortran is the answer to the scientists' problem is Honeywell. Honeywell has just released an updated operating system, GCOS 6 MOD 400 Release 3, which it hopes will move it further into the scientific market. It uses more of the Fortran instruction set than previous releases.

"We also offer an option on a scientific instruction processor, called SIP, which increases the speed of Fortran," says Gary Young, product manager of Honeywell's mini/micro systems division. "That's similar to the commercial instruction processor (CIP) which can be used for commercial jobs."

On the subject of operating systems John Robson of Perkin-Elmer is emphatic. "The question is not of which operating system is being used, but whether

it's virtual or real-time.

"A virtual operating system does commercial work very well as it has good multi-user capabilities, but obviously for scientific purposes you get a better response with real-time operating systems."

Robson agrees with Irwin from Prime that Unix is probably not all that useful. "It's a bit of a Goliath really, it's the new buzz word. It's very good at multi-user time sharing, but not so good for real-time uses."

Adrian Wise, general manager of Gould SEL Computers, does not think operating systems are too important. He comes back to the two ideas of real-time applications and mathematical performance. "The question is, what can the computer do in terms of talking to the outside world - what is its speed of response."

"On the performance side industry needs to find a good measure. In Gould, for instance, we use Whetstone instructions per second. Many other companies use

MIPS, which is very confusing, as different companies have different MIPS measures. When we are talking about floating point instructions, then Whetstones should be the standard."

Gould has three scientific minis ranging from the 1/2 Mbyte Whetstone rating to the 8 Mbyte Whetstone 32/87 model. Gould vies with Prime for the number two spot in the scientific market, but the runaway number one manufacturer is Digital Equipment, with its PDP 11 and Vax families.

Surprisingly enough, Digital is not too impressed with its record. "When the Vax was introduced it was seen as a scientific machine," says a spokesman for the company, "and we've been trying to get away from that. The Vax is the same machine with the same operating system whether it's sitting in a bank or sitting in a laboratory."

About half of Digital's Vax machines are now used for commercial applications, but 50% of them are still used in scientific environments.

One firm that does use Digital hardware is Calmar, the computer-aided design firm. It uses Vax 11/780s and 11/750s and Data General Eclipse minis, which it markets with its own graphics controllers and workstations, and CAD software.

David Cumming, the technical manager, explains why the firm opted for Digital: "One very neutral reason was because the Vax was an accepted product, it was well-recognised. Also some of our potential customers already had Vaxes and had people trained to use them and so on."

"One positive reason why we took on the Vax - and we've been using them for 10 years now - is the large range of application software available that is parallel to our own."

For example we have Calmar software to output information for finite element analyses, and there are several packages around written for the Vax that handle finite element analysis.

"Also, of course, the speed for arithmetic work is impressive on the Vax, although in CAD not all the calculations in interactive graphics are dependent on the machine speed - it often depends on the speed of the user. So another thing we've tried to do is prevent interruption of the load on the processor and we've done that by putting an intelligent buffer in our terminals. No computer can work very well if it's being interrupted all the time."

Cumming has one other requirement for the hardware of the scientific mini: "We needed something that could service different users at the same time, when they are doing different tasks. The Vax can do that very well."

"Also, in the scientific field you need much more advanced graphics, and faster interaction between the computer and graphics terminal."

"Fortran is still by far the most common language, and will hold on to that position because of its portability. Pascal is beginning to move out of the academic world, too, and there are several newer languages, like Modular 2."

"Obviously floating point is needed for fast computation, although that does not apply so much to digital design."

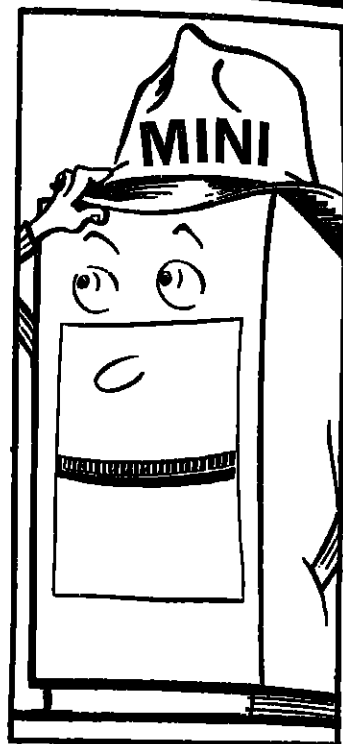
"The other thing is whether single user or multi-user machines should be used."

"Although we did think things were moving towards single user machines for scientific purposes - we're in the process of installing several hundred Perqs for example - we've decided that single user machines will not become universal in the laboratories." Manufacturers take note.

Now the firm is investing in a top-of-the-range 3250 to complement the 3220.

"We will use the 3220 for development of fluid analysis programs," says Spalding, "and the 3250 for applications."

Spalding has clear-cut views about what he wanted in the machine he bought. "Firstly we wanted Fortran, as we write and



use programs written in Fortran, and secondly we wanted number crunching power."

"Perkin-Elmer is the best we've come across in those two areas, and it has also got a very nice operating system - very easy to use."

CHAM is also installing a 3250 in its North American office.

So, Fortran, multi-user capabilities and number crunching speed appear to be what the users want, as well as the software packages available on the machines, at least in the specialised CAD and engineering fields.

Finally, one of the more varied scientific mini users around is the Science and Education Research Council (SERC). At its Appleton Rutherford laboratories there are enough scientific minis to keep

"Single user machines will not become universal in the laboratories"

scientists happy for centuries.

The Rutherford Appleton labs have six Prime minis, five of which are connected to Prime's ring hardware, SERCnet. SERC has altogether 22 GEC minis, some of which look after the exchanges and gateways to British Telecom's Packet Switched Service from SERCnet.

As well as that there are 16 other GEC computers which run the same software but are not under the direct control of the division, such as the Project Universe machines. There is also a smattering of Perq scientific minis, the software for which was developed by SERC in conjunction with ICL.

A spokesman for SERC puts the emphasis on software when he describes a scientific mini: "Software is very important. People use scientific programs in writing their own software so they need the building blocks, such as graphics packages and compilers, rather than the sort of complete systems you might get in a commercial environment."

"Also, in the scientific field you need much more advanced graphics, and faster interaction between the computer and graphics terminal."

"Fortran is still by far the most common language, and will hold on to that position because of its portability. Pascal is beginning to move out of the academic world, too, and there are several newer languages, like Modular 2."

"Obviously floating point is needed for fast computation, although that does not apply so much to digital design."

"The other thing is whether single user or multi-user machines should be used."

"Although we did think things were moving towards single user machines for scientific purposes - we're in the process of installing several hundred Perqs for example - we've decided that single user machines will not become universal in the laboratories." Manufacturers take note.

Now the firm is investing in a top-of-the-range 3250 to complement the 3220.

"We will use the 3220 for development of fluid analysis programs," says Spalding, "and the 3250 for applications."

Spalding has clear-cut views about what he wanted in the machine he bought. "Firstly we wanted Fortran, as we write and

## MINICOMPUTERS AND PERIPHERALS

Rob Fenner looks at specialised peripherals, like those television used to illustrate the election

# Mini partnerships

DESCRIBING a computer is not simple. There are, to begin with, a number of standards by which its innards can be judged: how intelligent is it? How fast does it go? How much memory does it have? And how many things - processing tasks, other pieces of equipment - can it support at the same time?

Then there are the software and the application for which it was designed. These, too, can alter the way we think of the machine.

There is also the constant shift in technology which, like land exposed by an ebbing tide, changes the picture of something we recognised and thought we knew.

It is even more difficult to pin down a group of computers to one word. Take minicomputers, for instance. Anything, from parts of Sperry's 1100 range through DEC's Vax family to the desktop HP9000 from Hewlett-Packard, could be termed a minicomputer. Size, in other words, is no longer a safe yardstick by which to judge them; and nor, for that matter, is the range of products available that can be supported by them. There is hardly a machine on the market nowadays which does not support a printer or a memory drive of some kind.

But there are other types of peripheral equipment - some of them highly specialised and geared towards applications very different from the more usual demands of commerce - which are found more commonly in the company of minicomputers than any other kind of machine. In general, this is because these devices need the processing power, the speed and the multi-tasking facilities that nothing smaller than a minicomputer can provide.

Quality graphics is an obvious example. A mini-based CAD/CAM system is capable of producing far better graphics displays than workstation models, because, to begin with, there are substantial memory resources available to support an on-screen design. The refresh rate of the screen must be high, to enable fast interaction with the design and the elimination of "ghosting".

What's more, there must be a number of RAM cards dedicated to supporting any one "frame" of design, providing a high level of clarity and colour. The greater the number of pixels on the screen, the sharper the picture and greater the amount of memory needed; similarly with colour.

There are mini-based systems on the market today that can not only maintain a colour palette of nearly 17 million hues, but can display all or almost all of them simultaneously.

The need for such sophistication is limited. A market is growing for cheaper, desktop systems, which, with a palette of say, 256 colours, and a screen resolution of 312x512, are adequate for most people's needs. But the large, fast machines have their place; and the quality of pictures they produce leads them into interesting applications areas.

A month ago, you may remember, there was a general election. Anyone interested enough to say up and watch the results come in probably saw the versatile and sometimes incomprehensible graphics - did you see that archery target? - with which the BBC illustrated its programme. Her charts and pie charts of that kind none the less easy not cheap.

The BBC's Computer Graphics Workshop built the system around a Vax 11/70, which maintained a database continually updated as each constituency result was announced. The database was composed of a number of entries:

Logica's Flair processor, originally designed by the BBC's Research Department, provided

the continuous display of the state of the parties around the country which sat on the wall behind David Dimbleby's head throughout the programme. The production team, naturally, also had access to the database, for information on results and interviewees available for coverage.

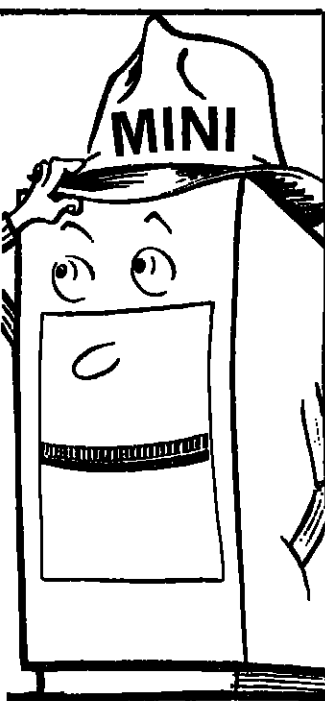
The other graphical ways in which the database was used were numerous. The headlines, for instance, which were flashed on to the screen at intervals were generated automatically; and most interesting of all were the graphs and designs which replaced the old swingometer.

To begin with, the result under observation was selected on a priority-based queue structure built into the Vax, which ensured, for instance, that constituencies such as Finchley, Bristol East and Glasgow Hillhead were not overshadowed by those in the late of Wight and the Scottish Highlands.

From this result a number of displays was generated: a "full form", listing votes cast and the majority obtained; a map for the more important constituencies; and, finally, a range of "party share" and "analysis" graphics.

These last were produced mainly with the help of Quantel's DPB 7000 series Digital Paint Box in conjunction with the Flair device. The Paint Box doesn't sound particularly unusual - it has a CPU, a touch panel, a keyboard, monitor and Winchester - but it is capable of sophisticated pictorial effects. Based on information received from the Vax, the Paint Box operator was able to compose a screen with a range of colours, shapes and textures at his or her disposal, and could overlay the graphics format - bar chart, pie chart, archery target - with video images held on the Winchester.

The display could also be animated: some of the charts display on June 9 altered as the Vax database was updated or as the video frame was replaced by another retrieved from the Winchester.



described in terms of resolution, accuracy, repeatability and, to a lesser degree, speed.

Resolution measures how close together two points can be and still be recognised as two separate points. A high resolution is necessary, for example, in electronic circuit design.

Accuracy refers to the correlation between measurements output by the digitiser and actual measurements.

Repeatability measures the ability of an input device to produce consistent results when digitising the same set of points many times.

Quantitative measures of speed are commonly used to measure raster scan display and plotter output rates, but graphics input or digitiser speed depends more on the operator than the hardware. Cameras and raster scanners read data faster than digitiser tablets, but with device types input rates are similar.

A final performance parameter of these products, as indeed of

other graphics devices, is intelligence. Many input, display and output devices today have powerful microcomputer systems integrated into them or into their controllers. For digitisers this means a buffer which can store hundreds of co-ordinate pairs until a busy minicomputer host is ready to accept them.

Speed, however, is more important a criterion for graphics output devices such as plotters. There are a number of these machines on the market, and they too come in a range of sizes that make a typical application hard to define.

Largely, however, plotters remain minicomputer peripherals. They are required to produce large drawings and so they tend to take up a lot of floor space.

They also present problems which affect the plotting speed. Pen changes in mid-plot, for example, can mean that the carriage has to cross from one side of the paper to the other before the drawing can be continued.

A final performance parameter of these products, as indeed of



This composite picture of the Prime Minister shaking hands with herself was created on Quantel's Paint Box. Two five television pictures of Thatcher's head and shoulders were frozen and stored in the Paint Box's memory. An artist then used the power of the Paint Box to extend these images down to Thatcher's waist by picking up the colour contained in the pictures and painting in her arms and the balance of her dress. Using the stencil, airbrush, and cut and paste facilities of the Paint Box, the artist then enlarged the background of one picture and added the other to complete the effect.

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## MINICOMPUTERS AND PERIPHERALS

TABLE 1: BRITISH EXPORTS OF EQUIPMENT BY PRODUCT GROUPS (BY VALUE)

	Mar 1983 £000	Dec 1982 £000	Jan-Mar 1983 £000
Peripheral units			
Disc storage units	8,058	7,388	19,138
Magnetic tape storage units	611	462	1,564
Other storage units	78	413	260
Printers	5,454	4,775	12,470
Readers and punches	182	464	603
Visual display units	17,490	15,794	40,309
Other terminals and consoles	832	353	2,086
Other peripheral units	16,655	14,353	37,979
Offline data processing equipment			
Punches, verifiers and calculators	12	22	35
Other equipment	488	911	1,563

TABLE 2: BRITISH EXPORTS OF EQUIPMENT BY PRODUCT GROUPS (BY VOLUME)

	Mar 1983 No.	Dec 1982 No.	Jan-Mar 1983 No.
Peripheral units			
Disc storage units	5,321	3,715	16,854
Magnetic tape storage units	362	180	999
Other storage units	49	172	158
Printers	18,417	5,720	32,366
Readers and punches	70	171	223
Visual display units	20,719	15,399	45,621
Other terminals and consoles	856	273	1,894
Other peripheral units	14,790	9,661	34,681
Offline data processing equipment			
Punches, verifiers and calculators	15	110	136
Other equipment	205	669	1,640

TABLE 3: BRITISH IMPORTS OF EQUIPMENT BY PRODUCT GROUPS (BY VALUE)

	Mar 1983 £000	Dec 1982 £000	Jan-Mar 1983 £000
Peripheral units			
Disc storage units	24,241	13,013	53,070
Magnetic tape storage units	4,296	2,257	10,418
Other storage units	1,106	839	2,419
Printers	15,738	12,526	39,249
Readers and punches	695	547	1,260
Visual display units	9,666	8,876	28,617
Other terminals and consoles	4,195	2,003	8,814
Other peripheral units	24,600	22,052	69,673
Offline data processing equipment			
Punches, verifiers and calculators	32	29	132
Other equipment	963	722	3,078

TABLE 4: BRITISH IMPORTS OF EQUIPMENT BY PRODUCT GROUPS (BY VOLUME)

	Mar 1983 No.	Dec 1982 No.	Jan-Mar 1983 No.
Peripheral units			
Disc storage units	36,588	18,340	90,760
Magnetic tape storage units	10,970	755	26,100
Other storage units	1,106	839	2,419
Printers	31,740	21,944	78,249
Readers and punches	2,582	1,825	4,031
Visual display units	21,283	19,637	80,085
Other terminals and consoles	5,927	2,947	11,065
Other peripheral units	33,677	22,028	109,168
Offline data processing equipment			
Punches, verifiers and calculators	40	178	181
Other equipment	2,090	1,729	8,401

## Imports rise will go on unless UK fights back

Peripherals from abroad have risen 60% in a quarter, says John Aczel

IMPORTS of computer peripheral equipment have risen dramatically and have jumped in value in recent months. This growth in foreign deliveries affected most products in the peripheral sector, especially printers and storage units of various kinds.

Clearly, imports will continue to increase sharply unless home-based British firms can fight back the influx of foreign products. Some of the items coming in from abroad are very competitively priced, and even if sterling should fall further, it is predicted that they are likely to take an even bigger share of the British market.

And competition is hotting up in the UK market, with further price cuts likely in the coming months. Evidently, a rise in imported products was expected due to the current buoyancy in the British computer sector. Demand for most types of computer hardware has been at a high level since the beginning of 1981, and sales of computer systems, especially mini and microcomputers, have been forging ahead in recent months.

But it appears that the rise in imports has been much faster than expected, especially as sterling has been losing ground during the early part of 1981 against the dollar and other foreign currencies. This should have made imported products more difficult to sell, but this has not occurred, as foreign suppliers have been adopting an aggressive marketing policy and cutting their prices recently.

There has been tough competition in the British market, and, for a wide range of products, extensive price reductions have occurred, despite the fall in the value of the British currency. Thus the average price of imported peripherals dropped to below £600 per unit in March, as against over £700 at the end of 1980.

Any such comparisons, however, have to be treated with some caution, due to the wide variety of peripheral products imported, but even so the underlying trend for prices has been firmly downward during this period.

Overall imports of peripherals have jumped in value and rose to £84.5 million in March. This com-

pared with £62 million at the end of 1980, and the cumulative figure for the first three months has reached a record total of £213 million.

In terms of volume, the increase in imports has been even faster and over 140,000 units came into the UK in March, which represented a growth of 60% compared to three months ago. Most major suppliers of peripheral equipment have been active in the British market, particularly the US and Japan.

Sales by the US jumped by 22% and reached a record of £44 million in March. They accounted for over 50% of total foreign deliveries,

particular, imports from West Germany went up by 80% to £8.3 million, while deliveries from the Netherlands and France also moved up markedly.

Imports of certain products have shown an above average rise, including storage units of various kinds. Their value rose to £28 million during March, which compared with about £15 million at the end of 1980.

There was also a significant increase in imports of printers, with their value going up by 20% to £16 million. The increase by volume, however, has been much more pronounced, as considerable price-cutting has occurred in this sector. Nearly 32,000 computer printers came into the UK in March, which was a record for these products.

Exports of peripheral equipment have shown some increase, but this has been more limited, especially when compared to the trend in imports. By value, British sales abroad amounted to £49 million in March, which was up by 12% compared to December.

It had been expected that British sales of peripheral products would increase markedly but the underlying trend has been somewhat mixed in recent months. With the fall in sterling at the beginning of 1981, this should have helped to boost British sales overseas, but the rise has been patchy, and, obviously, some British firms have not taken advantage of the drop in the pound to step up their sales abroad.

In numbers, exports of peripheral units were well maintained at 60,000 units. This was considerably higher than at the end of 1980, while for the first three months of the year deliveries abroad reached over 130,000 units, which can be regarded as a good performance in the current economic situation.

On the whole, British prices of peripheral units have been coming down and averaged just over £800 per unit in March. This was considerably lower than at the end of 1980, and, obviously, some British firms have been willing to reduce their margins in order to maintain their sales abroad at a satisfactory level.

In terms of product groups, useful gains have been seen for VDUs, with their value rising by 10% to £17.5 million. In addition, some gains have also been reported for printers, with their value going up to £25.5 million, though most of these products were at the cheaper end of the market. In addition, exports of disc storage units showed a marked increase in volume, reaching over 5,000 units during March.

The trade deficit in the peripheral sector continued to grow and amounted to £35 million in March. This compared with £18 million at the end of 1980, while for the first three months of the year a record imbalance of nearly £100 million was seen.

If current trends continue, the gap could be even more pronounced in 1981.

This is where each arm of the US Services will have a chance to identify its greatest needs and to step into the lead role for particular development projects.

However, in the best military traditions, there is some dirty work to be done that will be done anyway and will not wait for volunteers. These "tasks" are on the critical path of the STARS program.

The conventional rush towards automating everything in sight is combined with the military services' iron grip on what is used to evolve this automation.

The contractual negotiations promise to be spectacular. Specific support systems will be mandatory for contractors, unless they can provide a convincing case for some alternative.

The leverage to be used is the level of seeding to the Department of Defence by each contractor and for each part of a project. In the main projects, the development of un-

planned tools is to be prevented in this manner.

The innovative, alternative approaches, part of the STARS project, are the bait to attract many parts of the academic world and some within industry. The constraints on these alternative ap-

proaches are not as stringent as in the mainstream, traditional areas of development.

The availability of "ideas from the community" will be the determining factor in deciding how this side of the STARS project gets along. The community persists along, the community persists along, the community persists along.

Each contractor is expected to need about £1 million to £1.3 million over the next couple of years in "seeding money" just to get the

design and definition stages rolling towards production.

The automated support environment is part of the short-term attempt to head off general de-

pendence in the US. According to the official strategy document, it "will quickly consolidate existing technology and produce some new tools and techniques. However, the identified task area strategies have identified many other opportunities".

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TABLE 5: BRITISH EXPORTS OF PERIPHERAL EQUIPMENT (BY MAIN MARKETS)

	Mar 1983 £000	Dec 1982 £000	Jan-Mar 1983 £000
Belgium-Luxembourg	1,625	1,311	3,586
France	8,820	6,159	19,953
Germany (West)	9,965	10,647	23,109
Italy	4,882	5,092	12,856
Netherlands	2,286	2,332	5,481
Norway	1,386	806	2,472
Saudi Arabia	1,891	880	4,187
South Africa	1,560	1,648	2,986
Spain	1,801	1,697	4,582
Switzerland	1,978	1,644	4,359
Sweden	1,963	2,460	4,359
US	2,598	1,985	7,288

TABLE 6: BRITISH IMPORTS OF PERIPHERAL EQUIPMENT (BY MAIN SUPPLIERS)

	Mar 1983 £000	Dec 1982 £000	Jan-Mar 1983 £000
Belgium-Luxembourg	2,144	741	4,551
Canada	392	391	1,510
Denmark	610	607	1,647
France	3,392	2,431	8,230
Germany (West)	8,284	4,559	20,031
Ireland	2,069	2,197	5,726
Italy	2,819	2,413	7,737
Japan	6,785	3,908	16,520
Netherlands	6,663	3,234	14,979
Spain	549	531	1,630
Sweden	2,413	1,843	6,093
US	44,324	36,319	114,765

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## DEFENCE STRATEGY

Hedley Voysey charts the US Department of Defence's search for a better software engineering strategy

THE flap in the US about retaining technology leadership is breeding project after project. A few years back this was mostly a hardware matter and resulted in the Very High Speed Integrated Circuit project (VHSIC).

As it turns out, this has only made matters worse by producing a great, unsatisfied need for designers who can work across hardware and software boundaries, so making reasonable linkages between the two.

The Department of Defence in the US is now hunting for better software engineering via a Software for Adaptable, Reliable Systems (STARS) strategy.

It can easily be considered as a boost for the Ada Program Support Environment, and some of the immediate spin-offs from that. However, this is not really so, because this is altogether a more long-term and widespread effort.

Specifically, it entails boosting the university world's education and training, both by leaning on the curriculum and by enhancing the heaps of hardware and software hanging from the walls like electronic ivy.

It involves "non-traditional" approaches that are to be kept on the rails by a Software Engineering Institute. The mainstream activity of the institute will be completely "traditional" - it will aim to construct an automated support environment.

The mainstream thrust is to have parallel streams. The institute will evaluate the competition and "derive common characteristics".

The start-up costs envisaged for the traditional evolution of the Ada Program Support Environment into a more snappy, automated environment may startle some.

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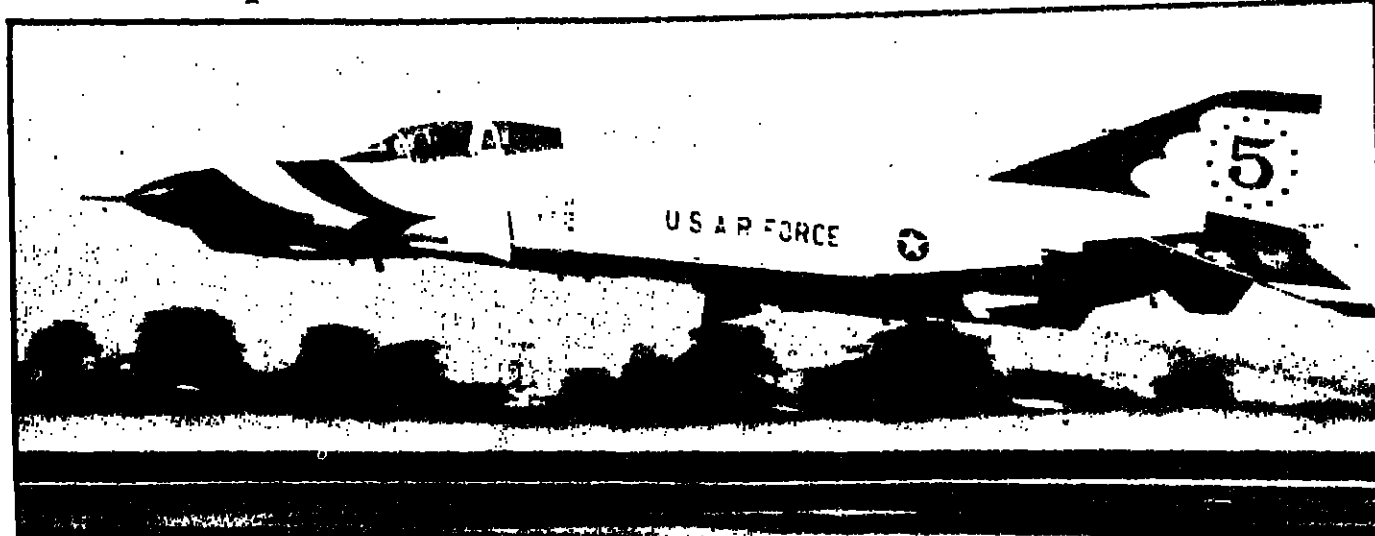
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Each arm of the US Services will have a chance to step into a Star role for particular development projects.

## Pentagon takes path to Stars in a bid to stay in technology lead

groups that try to uncover more fundamental ways of enforcing competence in silicon chips.

The STARS strategy clearly sees that the moving target it is aiming at is both a boon and a source of confusion. It talks of advanced computer architectures and knowledge-based systems as offering great potential.

It is also clear that the "pay-offs" cannot be stated in current terms, because our notion of software de-

velopment and support will change, and different skills will be required when working with the new concepts.

So part of the role of the Software Engineering Institute is to give early warning to the rather monolithic weapon systems community and its associated bureaucracy about changes in skills that will be needed - that is if the revolution ever comes.

As a matter of contrast, the groups in the US most concerned with software engineering via the professional societies involved have recently noted the sudden interest in truly formal reasoning by hardware designers in the newest and highest densities of microchips.

Now the point that strikes both software and hardware engineers is that the formal reasoning skills are most closely associated with mathematics, and that subject is poorly taught both to electronics students and to computing and business studies students.

In both software and hardware, there is a clash between the senior elements trained in the patterns of the last 15 to 20 years and the new formality which is emerging as the basis for both types of design task.

The "methodology" fashion seeks to stave off the terrible day when the rigour of reason takes over.

The elaboration and automation of design and checking methods is pursued in both hardware and software groupings as being "the most practical" and "the most suitable for the evolution of systems".

That may well be so for the Eighties, but the common issues facing hardware and software development camps suggest very strongly that, as the evolution is successful, it will accomplish a metamorphosis from its origins.

If it is not successful, it will produce thousands of useful skilled in coping with the depression felt by those who build artefacts more complex than they can judge or maintain.

Ada fashion was well and truly launched, it would need some hefty intellectual bureaucracy to manage the changes to the smart Ada uniform worn by all well-trained software engineers working with embedded computer systems.

However, the proposed Software Engineering Institute would become a Consumers' Association for all manner of software engineering bits and pieces, as well as talent-spotter around the research

sharing.

The desired working environment must be structured to provide for the nation's defence through maximum co-operation within the context of the free enterprise system.

After this thunder and lightning it will come as no surprise that much of the substructure of the STARS projects seems to be concerned with improving communications of all kinds. There is at least equal emphasis on the need to improve the baseline of skills and education that is drawn on in the Department of Defence.

If industry develops a tool or technique for Department use under the rules of the STARS project, it will get a good chance to make money

This set of objectives necessarily involves a longish perspective on parts of the project. The STARS project is sketched out over a 10-year period running to 1992. On the topic of alternative approaches, for instance, the most promising solutions are not due to be selected until 1985/6, with experiments in these areas running until the late '80s and the building of prototypes around 1990.

This stream of work is unashamedly labelled fundamental research. It is clearly stated that the aim is to make breakthroughs and quantum jumps in state of the art alternative software environments. This work is not tied directly to the other project streams until near the end of seven years of STARS projects.

Compared with the £4 billion a year the Department of Defence spends on software at the moment, the funding requests for STARS are pretty modest. At the peak, in about four years' time, there is a call for about £40 million a year to be put into the kitty. The smallness of this sum is a bit misleading, however, as it excludes all the complementary work in the VHSIC project and many fundamental pieces of study already supported by the Defence Advanced Research Projects Agency.

The institutional evolution aimed at by the STARS project is slightly more provoking. It was always envisaged that, once the

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## PEOPLE

## Comart gives Beazley chief sales position

Comart Scotland, the new Scottish sales division of the Comart group of companies, has appointed John Beazley as senior sales executive. Beazley will be responsible for Comart Communicator major account and distributor business in Scotland and sales to Scandinavia. He has previously worked for Burroughs and Computer Technology.

Manufacturer Modcomp has named Bob Gurney major account executive, a new position that includes management of major European and Middle Eastern OEM and distributor accounts and technical management of

European Viewdata joint venture developments. He first joined Modcomp in February 1981 as a senior consultant.

Following the company's success in the aerospace industry, MatEval has appointed Terry Kelly sales manager. He is responsible for all aspects of international sales. He joined MatEval as the project manager for aerospace in 1981 and has been responsible for the fully automatic ultrasonic inspection systems supplied for the Space Shuttle programme and the "Roboscan" system for aircraft components.

MDS Computer Systems (UK) has appointed David Bedford principal business consultant. He will be based at the company's Birmingham office with responsibility for key accounts. He joins MDS from ICL, where he was employed as a systems consultant on a major account.

David Sumner is to set up a UK subsidiary for US-based IDC Services, the entertainment and advertising data processing specialist. It will be called Talent and Production Services and aims to start operating on October 1. Sumner was previously chief executive of the Industrial Relations Secretariat at the ITCA.

Harris Corporation has appointed Jim Payne as general manager of its German information systems activities. He will manage the rapidly growing Harris super-mini-computer, distributed data processing and interactive terminals product lines. He will be responsible for sales, marketing, support, service and administration for a 50-man operation in Frankfurt. Payne has held a number of management positions with Harris Corporation, the most recent of which was vice-president of North American operations for the Harris Customer Support Division, Dallas, Texas.

Richard May has been appointed sales executive for Libra Computer Systems, specialist in turnkey computer systems for the publishing, printing and allied industries. He joins the company from Data General and will be based at Libra's new head office in Essex.

Atari International (UK) Inc has combined its Video Computer Systems and Home Computer Systems divisions and the sales and marketing teams have been restructured to reflect the changes. Andrew Swanson, formerly sales and marketing director for Video Computer Systems, becomes overall sales director, and Eric Salomon, formerly sales and marketing director for Home Computer Systems, becomes overall marketing director.

Pete & Pam Computers has appointed an engineering manager at its London office. He is Dave Mercer, formerly with Phillips Business Systems in build engineering and support.



Sara Galbraith (above) has joined Peachtree Software International as sales consultant for presales support. She joins Peachtree after three years with Data Logic, where she was word processing sales executive.



Digital Equipment Corporation has appointed Pier-Carlo Falotti (above) as vice-president for European field operations. Falotti, who will be based in Geneva, will be responsible for sales and service operations of all European subsidiaries. He is also a member of Digital's Corporate Management Committee. For the past six years he has been responsible for all Digital's European service and support activities. Michel Ferreboeuf has been appointed European marketing manager to assist Falotti. For the past five years Ferreboeuf has held the post of sales manager and marketing manager for the French subsidiary, recently transferred to Geneva.

W. W. Currie, director of Lion Office Equipment (Northern) and of Souththorpe, has been appointed president of the Office Machines & Equipment Federation (OMEF) for the period 1983/84. G. D. Kalghis, sales director of Baylis Wisdom, has been appointed senior vice-president. A. C. Amos, director of Markham Office Equipment, has been appointed junior vice-president, while J. P. Bedford, managing director of Silver-Reed (UK) and immediate past president of OMEF, has been appointed chairman of the Finance and General Management Committee. The federation represents the interests of retailers, manufacturers, importers, distributors and wholesalers of all sections of the office equipment, machines, supplies, office furniture, business computer systems and computer peripherals sectors.

Alan Davis has been appointed national sales manager for Wang UK. The growth of the company and a sales goal of £75 million in 1984 have led to the creation of this new title. Davis began with Wang as a salesman nine years ago, progressing to his most recent position of South-west district manager three years ago.

Activities in the new Aberdeen office of Yard will be headed by Joe McGhee. McGhee joined Yard's Computer Applications Division in 1980. The new regional office aims to provide an improved service to offshore and general industries in the Grampian area.



Optichrome Computer Systems has made two appointments as part of a major expansion programme. Patrick Meaney (left) becomes the new general manager. He has had 14 years' experience in the computer industry with companies including ICL, Honeywell and General Electric. At his most recent company, IER Microcomputers, he secured the UK distribution for the Fortuna 32:16 super micro. Simon Softbyte (right) also joins Optichrome Computer Systems, as sales support analyst. Since 1971 he has worked with major companies including Ever-Ready Batteries and George Wimpey as programmer and systems analyst. His most recent role was as director of New World Business Consultancy.



Precision Software, the independent software house specialising in the UNIX operating system market, has made John Green senior sales consultant. He will be responsible for marketing a wide range of UNIX-based applications systems through a nationwide network of dealers in the 16 and 32-bit microcomputer market. He joins Precision Software from NCR, where he was distributor manager specialising in distributor sales of general purpose micro and minicomputers.

Peter Caswell has joined Strategic Planning Systems International as sales executive covering the West Midlands, East Anglia, Yorkshire and Humbershire. He joins from Peachtree International Software, where he was a salesman.

Paul Appleby has joined MSA (Management Science America) as systems consultant. He was previously with Diversy, where he was technical support manager.

## PRODUCTS



The Powquip 745 acoustic enclosure.

## Cutting the decibels

DEVELOPED for use with the IBM 3287 dot matrix printer, the Powquip 745 acoustic enclosure reduces printer noise by a significant 70-80%.

The new unit is a complete foam-lined steel casing which entirely surrounds the machine. A transparent acrylic panel forms the top and front of the enclosure. This provides for visual observation and lifts up on gas struts for access. Continuous stationery

feeds in and out of narrow slots in the casing and blanking plates are supplied if the paper feed slots are not used. Pre-cut holes accommodate signal and power leads.

Since the sound-absorbing effectiveness of printer enclosures depend largely on the mass of the casing, heavy gauge steel is used. Power Equipment (CW), Kingsbury Works, Kingsbury Road, London NW9 8UU. Telephone: 01-205 0033.

## Viewdata IP system to run on Torch micro

A VIEWDATA information provider system to run on the British-built Torch microcomputer is announced by Metrolite Viewdata Systems. Using the Metrolite-IPT, the microcomputer becomes a powerful terminal with editing capability, bulk update and online update and local storage of users' databases. Databases can be used offline as well as online.

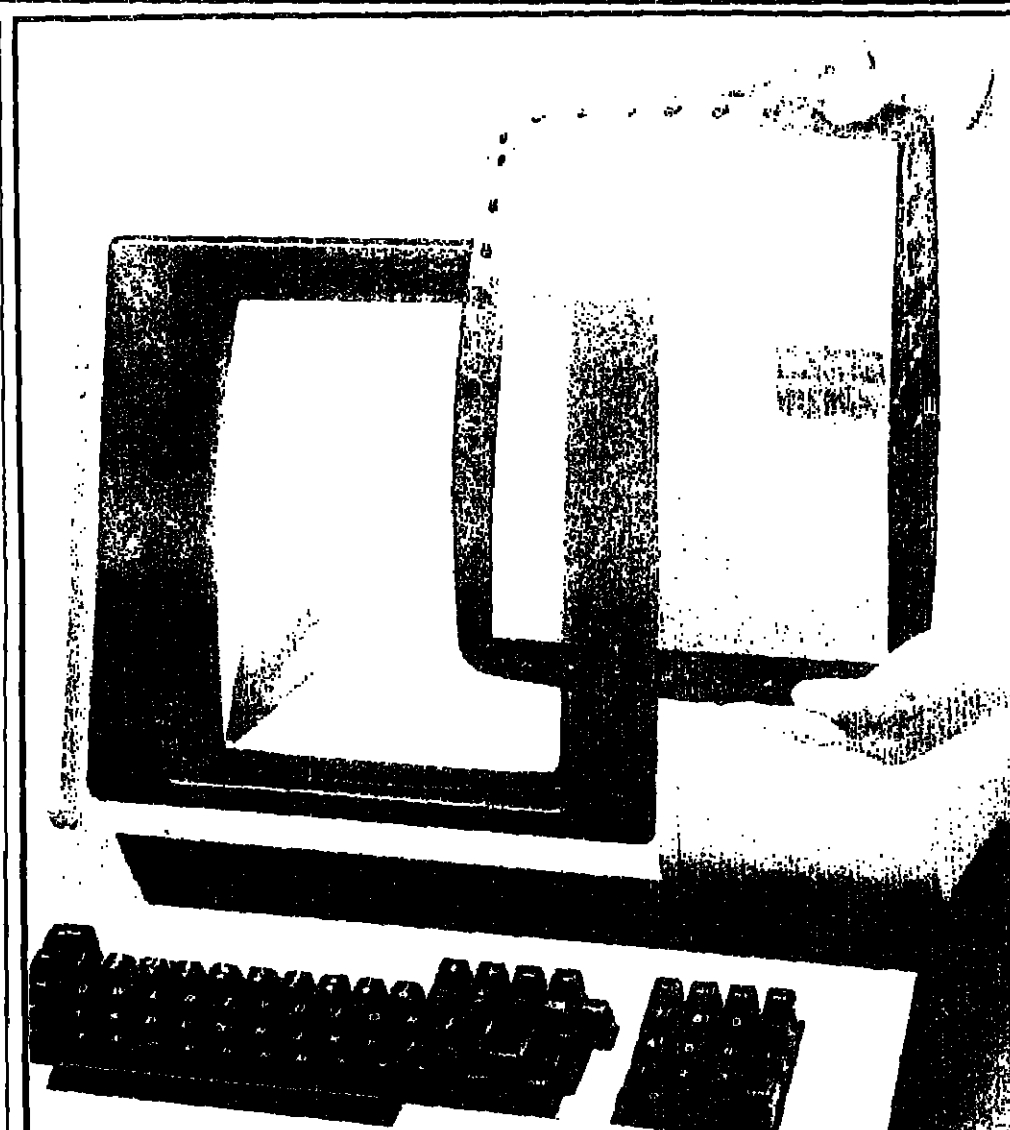
Typical uses, says Metrolite, will be for displaying information in department stores, estate agents, travel agents, hotels and leisure complexes, and for in-house viewdata systems.

Advanced word processing capabilities are provided as well as the usual Prestel editing facilities. WP and editing features include full word-wrap with colour attributes. Left, right, top and bottom margins enable the user to restrict activity to a part of the screen. Editing can be carried out within the margins while matter outside is fully protected.

By using margins together with word-wrap, text can be entered into areas of the screen by normal typing.

The system stores local databases on the Torch discs, with all the routing information.

Metrolite Viewdata Systems (CW), 6 High Street, Ruislip, Middlesex HA4 7AP. Tel: (08956) 77071.



The Elographics E270 transparent position sensor system.

## Transparent position sensor

A LOW-COST transparent position sensor system, the E270, which offers simplified finger-touch man-machine interaction for a variety of menu and graphic applications, is said to be easier to operate than light pens, joy sticks and graphic pads, is now available from Dicoll DataSystems. The company has

been appointed exclusive UK distributor by Elographics Inc, Oak Ridge, Tennessee.

The E270 offers a flexible way to communicate with an intelligent terminal or computer system, and opens new applications where speed of interaction or simplicity are paramount, says Dicoll DataSystems.

Being of simple construction, offers low-cost solution to a variety of computer control problems. The analogue output of the sensor offers resolution.

Dicoll Electronics Ltd, Bond Close, Kingsland, Baslington, Hants, RG24 7JL. Tel: Basingstoke 61551.

## Keeping track of workers

AN attendance management system suitable for companies employing upwards of 1000 people has been introduced by Cardkey Systems.

The MD4000 is based on DEC PDP-11/23 hardware coupled with Cardkey's own range of badge/card reader terminals. The MD4000 is designed to

cover all the standard attendance management requirements, including fixed and flexible working hours plus overtime, and can be amended to suit individual company needs.

In use, the MD4000 can dramatically reduce the time taken to collect and analyse company time and attendance statistics.

The new MD4000 has been developed to automate the whole process of time and attendance, and can be linked directly to payroll systems which will automate wage payment directly to clocking on-and-off.

Cardkey Systems (CW), 23 Stadium Way, Reading, Berks. RG3 6ER. Tel: (0734) 415211.

## New graphics software for Digital Equipment users

COMPUTER Systems and Products has announced new Host Computer Graphics Software for Digital Equipment users.

Textprint's HCGS is said to eliminate the need for costly and time-consuming reprogramming of applications software previously completed for Calcomp pen-plotters or Tektronix CRT displays and printers by converting the graphic data into DEC-compatible

form for fast direct viewing on the VT-125, DECplot LA-120, or LA-34 dot-addressable bit-map type terminals.

Full compatibility with Plot-10 and Regis, two popular vector-oriented computer graphics software languages, is available on the DEC VT-125 graphics display terminal with the Textprint 4014 Emulator. Graphics users can have both Tektronix Plot-10 compatibility

and DEC Regis compatibility in the same CRT unit.

Textprint's 4014 Emulator module allows graphics programs previously completed using Plot-10 vector commands to display images directly on the bit-map oriented VT-125 terminal, eliminating reprogramming for DEC-compatibility.

Full colour Graphics or text images created on the DEC VT-

125 display terminal can be directly printed or plotted on a "screen-dump" basis with Textprint's DECplot P1-125 interface option. This plug-in module fits inside any VT-125 unit to restructure the image data into serial form.

Computer Systems & Products (CW), Barrasford House, Goldsmith Street, Nottingham NG1 5JY. Tel: Nottingham 415155.

## Range of locked-joint frames

THIS Highlock range of locked-joint frames and panels can be set up as display units, partitions, exhibition stands, desks, racks, peripheral stands and other units.

The UK-built range is based on a strong frame connector, available in eight variations of locking arm for a number of different configurations.

The locking arms fit in the in-

ternal bore at the end of the steel square tube which frame.

The connector arm connects the bore, so units are rigidly squared as they are built.

Highlock (CW), PO Redkin Way, Horsham, Sussex RH1 5EQ. Tel: 67495.

## CONFERENCES

organised by Control Data. It will take place at Control Data Institute, London. Cost is £445. Details from Sylvia Lyons, 01-240 3400.

**AUGUST 8-12**  
Introduction to Organisation and Methods is designed for those involved in administration or management, who need to review current systems. It takes place at the Henry VIII Hotel, London. Course places at £510 may be booked through the course registrar, Cherry Bignmore, on 01-261 9237.

**AUGUST 16**  
Data Communications Overview at the Control Data Institute, London, gives an introduction to modern communications systems. Organised by Control Data, it costs £145. Details from Sylvia Lyons, 01-240 3400.

**SEPTEMBER 14**  
ISS Northern Branch is holding a seminar in Manchester on micrographics. Cost is £15 for members; £18 non-members. Further information from A. J. Oulton, (061) 228 5171.

with the relevance of computer-aided design in a management context. Cost is £65, plus VAT, per delegate. Details can be obtained from High-Point Research & Study, King Edward House, New Street, Birmingham B2 4QJ. Tel: (021) 632 4561.

**CALL** for papers has been issued by Association Française pour la Cybernétique Economique et Technique (AFCEET) for the second Software Engineering Conference. It will be held from June 4-8, 1984, in Nice, France. The aim is to survey current work in the field. Papers are invited on the description of practical experiments, including analysis of success or failure; new concepts for software engineering; applications important for their practical implementation; results of measurement of the properties of software; and theoretical studies that aim to solve practical problems. Potential authors should send a 10-line summary to AFCEET as soon as possible, and a complete 15-page text by November 15. The address is AFCEET, 156 Boulevard Peretie, 75017 Paris, France.

**THE New Technology of Construction Management** is a conference being held at the Faculty of Urban and Regional Studies, University of Reading, on September 14. Organised jointly by the faculty and High-Point Research & Study, it will explore the probable effects of new technology on the design/construction process. Papers will be presented on a number of subjects connected

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the Hyatt Carlton Tower Hotel, London, with two sessions, 2.00pm-5.00pm and 6.00pm-9.00pm. Then 2nd September at the Hyatt Carlton Tower Hotel, London.

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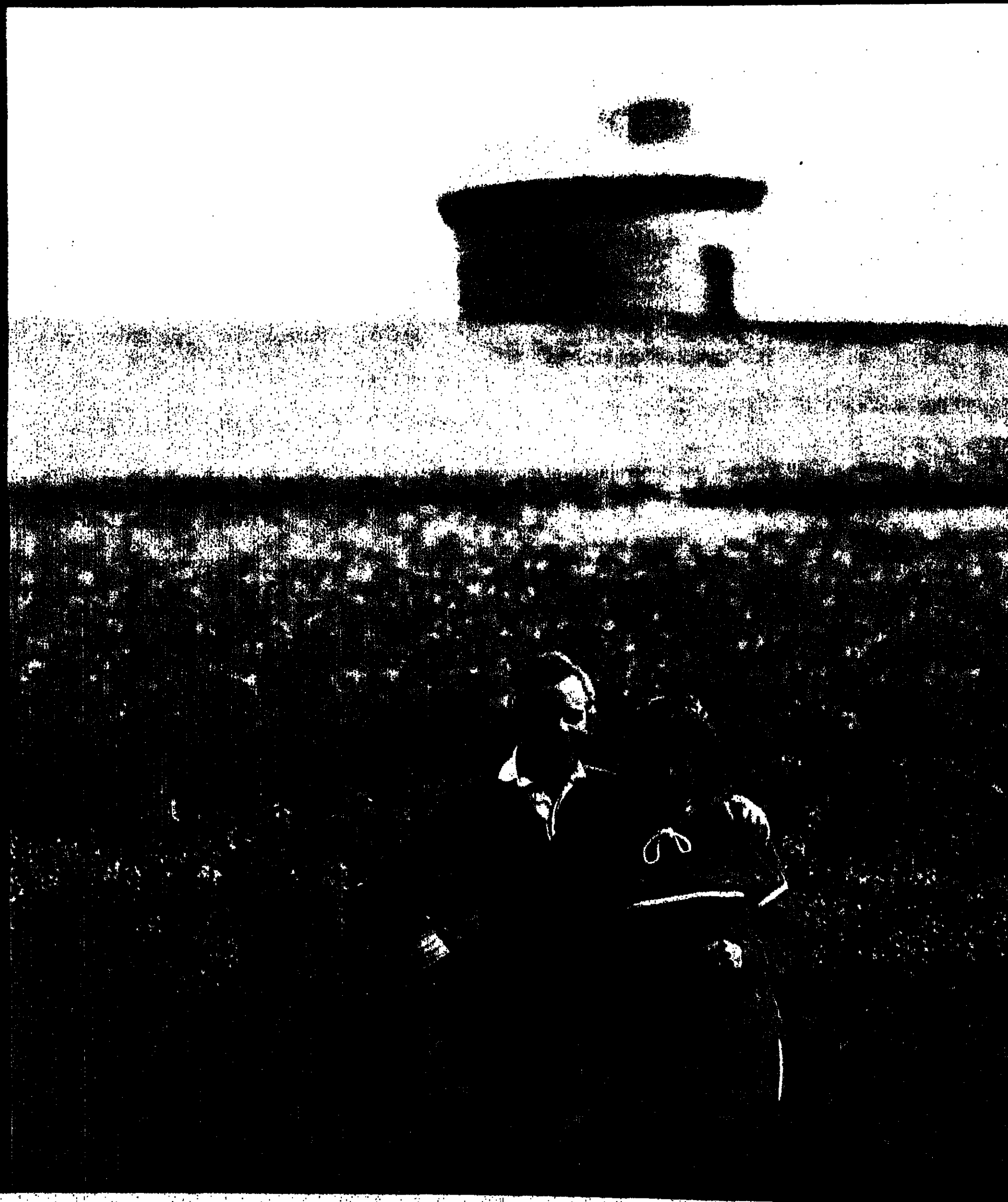
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When John Egan became Chairman of Jaguar Cars in 1980 they were reported to be losing £2m a month. Today – through an insistence on hard work, quality, and good communications – Jaguar is breaking all productivity and sales records.

# JOHN EGAN'S SUNDAY TIMES



Because I tend to work very hard during the week, Saturday and Sunday are the days I want to spend with the family and get away from work – it also

means I have time to spare if some crisis does crop up.

I go jogging every morning with my wife, and on Sundays we start out at about 9.00am, setting off along the river near Warwick where the countryside is really pretty. Julia does a mile and I generally do two. Our labrador, who has a great enthusiasm for life, comes along as well, and when Julia has turned back for home, takes a great leap into the air and jumps into the river.

Then it's back to a shower, breakfast and The Sunday Times, which I pick up on my way back from jogging. It's the only paper we take as a rule, but my newsagent is very enthusiastic so if he sees anything about Jaguar in the other papers he tells me about it and gets me to buy them as well.

I turn first to the sports results and reports, particularly rugby and cricket. Then I take up the business news, flicking through it for items of special interest. I always notice anything on cars, obviously, but also articles on employee motivation and success stories. I like to look at the positive things.

Then I turn to the main paper with the same approach, reading from the back because of my interest in sports. Here I read as much of it as it warrants, since in some weeks there's not so much news around. Generally speaking, I spend time on the centre spread with the leading article and the analysis of the week's event of major importance. Last of all I turn to the magazine and review section. I read a lot so I generally go through the book reviews.

The paper gets split up by the family in the morning, and in fact, my

wife reads more of it than I do. She reads it from cover to cover and passes lots of interesting things on to me.

By now it's about 11.30 and my normal routine – although I've been too busy for it in the last couple of months – is to go off for a game of squash. I always play the same guy who is currently leading me by about 400 games to 100, and afterwards we sink a therapeutic pint of beer. We have a super squash and tennis club near us so I can play tennis in the summer and squash in the winter.

Then I come back for lunch. The afternoon varies according to the season and the weather. If it's raining we all sit down and watch the film on television during which I generally drop off for a good sleep. During the winter if it's fine we go off for a long walk together. In the summer if it's sunny we'll have a barbecue and swim in our pool – I'd say my perfect Sunday is one where I can have a game of tennis in the morning and then a swim in the afternoon.

It's very much an at-home day. When we do have people to stay they generally participate in our activities, although I've never noticed anyone joining in the jogging.

On some Sundays we go off to watch motor racing. There's a programme of touring car races that Jaguar is involved in this year, two in Britain and the rest in Europe, and the family all go to the British ones. I didn't know much about motor racing when I first came here, but I have since found it very exciting. We had really nail-biting finishes in the last two races.

I like to spend the evening reading a book, listening to records with my wife or playing the piano, although I often have to tidy up some papers for the morning.

I couldn't envisage Sunday without The Sunday Times – it's an

integral part of the day. When I'm flying back from the States I always like it when they hand the papers round on the plane, because I feel as if I'm keeping in touch with what's going on.

Overall it's a very good, competent paper. I think I have ended up with The Sunday Times because it avoids the faults of most other papers. It avoids political extremes and makes an obvious attempt to be objective about everything.

**In a recent survey by the New Business Research Consortium, several interesting facts emerged:**

◆The Sunday Times is read by more businessmen than any other newspaper.

◆The Sunday Times is the only quality Sunday to have increased its businessmen's readership since 1980.

◆The Sunday Times has market leadership in most of the important occupational areas, including: marketing, 43.5%; computing, 32.5%; finance and accounting, 38.5%.

◆The Sunday Times has more readers in all the following categories: top income bracket, 51%; 2-car families, 36%; credit card ownership, 35%; value of shares £10,000+, 53%.

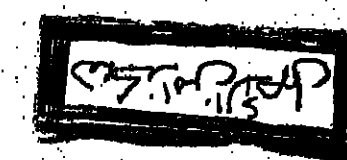
Almost every indicator showed The Sunday Times to be the top paper for business men and women.

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Newspapers  
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**More businessmen read The Sunday Times than any other newspaper.**



**THE SUNDAY TIMES**

## PRODUCTS

## Closed-loop Winchester stores 50Mbytes

A CLOSED-LOOP 5¼in Winchester disc drive that provides 50 megabytes of fast-access storage on plated media is being introduced by Tandon Corporation.

The Model TM705 is the second in a family of high-capacity drives offering high-performance, low-cost random-access memory for multi-user microcomputer and minicomputer business systems," according to Sirjang Lal (Jugi) Tandon, chairman and president. The new 50-megabyte drive is designed to meet the growing demand for even higher storage capacity in the standard 5¼in form factor. The first model, the TM703, features a 30-megabyte capacity and has been extremely well received in the marketplace since its introduction in 1982.

Full production is expected to begin in October, and the drive is expected to be priced at less than \$1,000 in large OEM quantities.

The TM705 features an uniform storage capacity of 50.1 megabytes using three 5¼-inch platted discs. High density recording is performed on five data surfaces, with the sixth dedicated to servo control. The drive has a track density of 1,000 tracks per

inch, and a lineal density of 10,416 bytes per track.

The configuration of 962 recording cylinders is nearly three times that of most open-loop 5¼-inch Winchester drives, says Tandon.

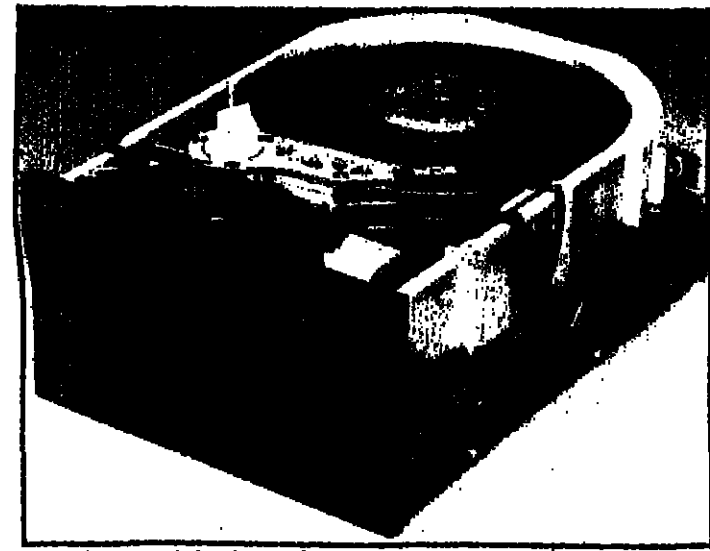
The TM705's closed-loop servo system, featuring a rotary voice-coil positioning arm, provides fast operating times. Track-to-track access time is 5msec. Average access time is 39msec, with a maximum of 85msec. Head settling time is 2msec.

An on-board microprocessor allows the TM705 to buffer positioning information. Other features include a brushless DC motor, a data transfer rate of five megabytes per second, and an industry-standard interface and power supply.

The TM705 measures 3½ inches high, 5¼ inches wide, and 8 inches long.

In 1982, Tandon delivered its one millionth 5¼in floppy disc drive — an industry first. The company is now manufacturing disc drives at a rate of nearly 25,000 a month.

Tandon Corporation (CW), 20320 Prairie St, Chatsworth, CA 91311. Tel: (213) 993-6644.



Tandon's TM705 closed-loop 5¼in Winchester disc drive.

## Plot with eight pens

COMPUTER graphics manufacturer Calcomp is extending into the mushrooming market for low-cost graphics hard-copy devices with the introduction of the Model 84 desk-top, eight-pen plotter for A4 size charts and drawings.

With the announcement of the Model 84 comes a significant shift in Calcomp's normal policy of selling to end users only through its own sales force and the company is now appointing qualified dealers and distributors for this new plotter throughout the UK.

The Model 84 is priced at about £1,500 and comes with driver software, interface, supplies and full documentation. The new plotter plots in up to eight colours on A4-size paper, and can produce high quality colour transparencies for overhead projection. Multi-colour drawings are plotted by liquid-ink, nylon tip or ceramic-tipped pens.

"The eight colour capability of the Model 84 is a prime requirement for today's business graphics user," says Calcomp's UK specialist for small format plotters and digitisers, Simon Weeks, "since the typical chart or graph averages five colours and often uses up to eight."

"Plotters with fewer pens do not meet the needs of the market."

To enable users to gain the maximum from the new plotter from the start, several popular graphics application software packages already support the Model 84. Among these are Chartmaster, which runs on the IBM Personal Computer, and a new Digital Research CP/M-based Graphics System Extension package.

Calcomp (CW), Cory House, The Ring, Bracknell, Berkshire RG12 1ER. Tel: (0344) 50211.

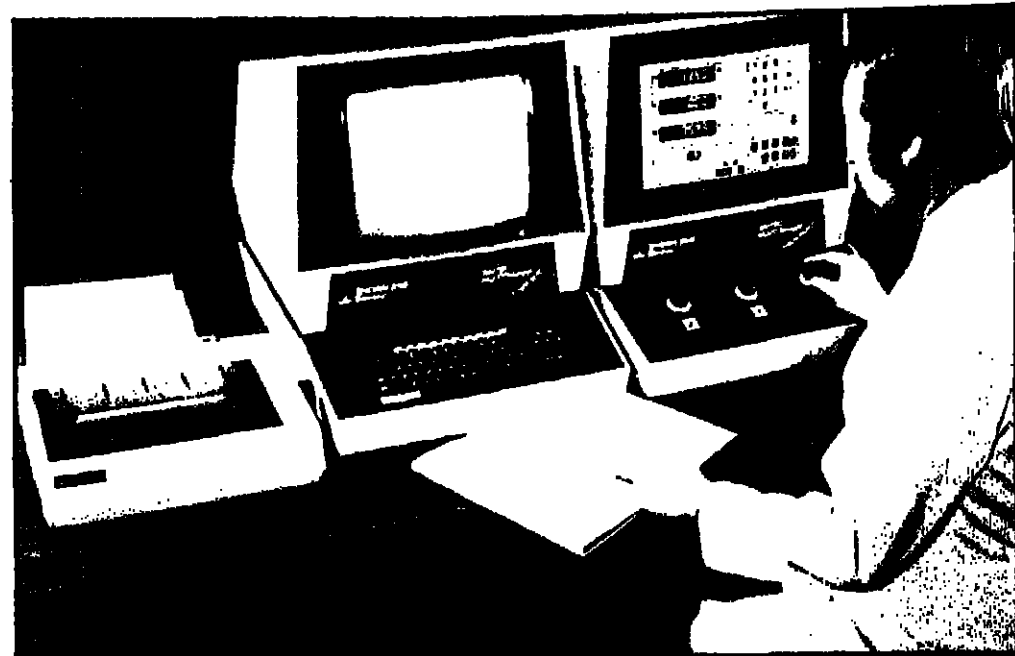
## Universal interface for Oki

A HIGH-SPEED universal serial interface for the Oki Microline models 82A, 83A and 84 matrix printers, is available from Peripheral Hardware Ltd.

With an end user price of £75, the interface enables the printers to operate on any of a wide range of RS232-C and current loop protocols, says Peripheral Hardware. It is suitable for most micro and personal computers, individual protocols being set using DIP switches according to instructions supplied.

The interface module is easily fitted inside the printer casing. It accepts data at rates from 50 to 19,200 baud, with full hardware handshaking in current loop mode, and the serial interface has a 2K buffer. There are separate signals for "busy" and "paper out/deselect".

Peripheral Hardware (CW), Monkspath Industrial Park, Solihull, West Midlands. Tel: (021) 745 3033.



The computer-based simulator with multi-coloured graphics from Thorn EMI Sinter.

## Machine tool simulator for training engineers

A COMPUTER-BASED simulator, with multi-coloured graphics representation, has been introduced by Thorn EMI Sinter for training of machine tool operators and other engineering trainees. The company claims that the simulator can form an ideal basis for training courses organised by the Engineering Industry Training Board, Manpower Services Commission and individual company training schools.

It can be used to train planning and methods engineers, as part of a course for trainee CNC programmers, and for re-training machine tool operators and setters. In addition, the equipment can be used as a general purpose computing facility within the education and training environment.

The Sinter Multitrainer has been developed as a result of cus-

tomers reaction to a simulator launched in 1982 which had a similar application but not graphics display facilities. To provide these on a colour monitor display it has been necessary to incorporate a computer within the trainer.

The equipment will simulate any 2- or 3-axis machine tool, and versatile software can provide exercises in turning, milling, drilling and boring. The sophisticated animated graphics, in colour on a video screen, enable students to watch the progress of simulated machining operations and assist in teaching the need for programming work in a correct sequence. Many other aspects of machine tool operation, such as setting of datum or absolute and incremental working, can be demonstrated.

An important feature of the

trainer is safety. Most aspects of machine tool operation, programming for manual data input, and an introduction to the concepts of computer numerical control, can be taught before the trainee encounters a cutting machine. Mistakes result in no more than a "black mark" from the computer.

Following its use in the classroom, the Sinter Multitrainer can be employed in the machine shops later in the training programme. It can be linked to manually-operated tools for students to repeat exercises programmed in the classroom but using the actual machine tool movements rather than the simulator.

Thorne EMI Sinter (CW), Sellers Road Drive, Bulwell, Nottingham NG6 8UX. Telephone: (0602) 273741.

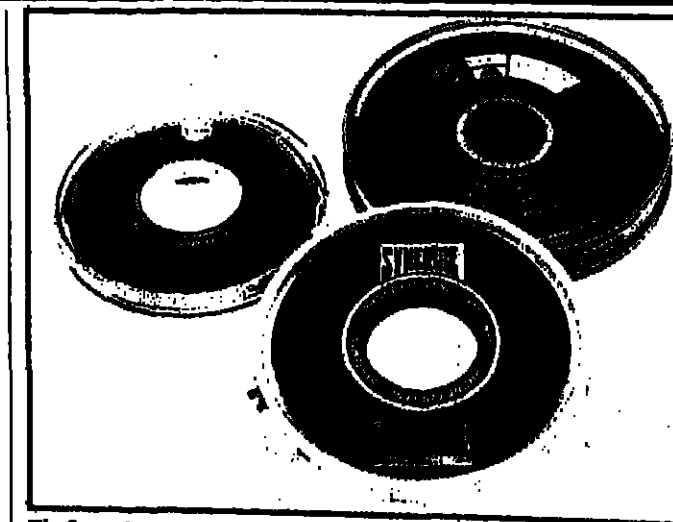
## WP package offers new features

FORTUNE Systems announces the release of its Fortune:Word word processing package to run on its System 32:16 business microcomputer. Fortune:Word is a performance enhancement of Fort:Word, the existing WP package for the System 32:16, and offers a number of new features.

Fortune:Word is reverse engineered, and new features include revised menus for greater consistency and flexibility, and a more powerful glossary feature to permit the storage and recall of standard phrases or editing commands. The scope of the "Help" facility has been extended for use with any menu and text editing screen.

Print wheels can now be numbered to facilitate printing in foreign languages, and new advanced functions supported include Spelling Checker, Records Processing, Index Generator and a Table of Contents Generator.

Fortune:Word will be supplied free to all current users of Fort:Word on the System 32:16. Fortune Systems (CW), Telephone: 01-741 5111/4.



The Synergie computer tape from Rhone-Poulenc.

## They've got data loss taped

A COMPUTER tape using a revolutionary magnetic coating and lubricant to prevent data loss and designed to ensure minimum deterioration over time is being developed by Rhone-Poulenc Systems.

Backed by a three-year guarantee the new Synergie tape is for use on high-speed tape drives and has an optimum recording density of 6,250 bpi.

Synergie involves two major innovations to provide unmatched quality. The first is a "newly processed magnetic coating giving extreme resistance to wear. Second, the company has devised a lubricant for the entire tape surface, minimising data loss.

Rhone-Poulenc Systems (CW), High Street, Houghton Regis, Bedfordshire LU5 5QL. Tel: (0582) 605551.

## 64K memory on single board system

THE ZX-86 is a single-board computer from Aim Digital Systems and made in the US by Zendex.

The computer, based on the Intel 8086 processor, is available in five-, eight- and 10-megahertz versions.

This OEM product has 8K of random-access memory, which can be expanded to 16K, plus sockets for up to 64K of read-only memory.

Communication speeds of between 75 and 19,200 bits a second can be selected through software. Up to 24 programmable input and output lines can be mixed in any combination of single- or bi-directional ports. BCD or binary interval timing can be supported through three built-in programmable timers.

Extra Zendex modules can be added to expand the ZX-86 through its three connectors.

Aim Digital Systems (CW), 98 Crofton Park Road, London SE4 1AL. Tel: 01-690 4428.

## High-speed drawings

A 10-COLOUR plotter, the Gould Bryans Computograph Colorwriter, is now available in the UK from STC Instrument Services.

A significant feature of the plotter is a buffer of between 2K and 16K. This means complete drawings can be put in the buffer at high speed, so the host computer is then freed to carry on processing while the plotter controls the drawing operation.

Software includes routines to handle variable line fonts, arcs, circles, bars, pies and zooming. The plotting speed is 40cm a second.

The A3 Colorwriter plots in up to 10 colours and the A4 model has seven. Standard pens can be used.

Options include pens for writing on clear media such as overhead projector transparencies.

STC Instrument Services (CW), Edinburgh Way, Harlow, Essex. Tel: (0279) 29522.

## Up to 16m colours

A NEW high-definition colour software package, Sidssoft, from High Technology Electronics, runs under CP/M and may be linked to high level languages such as MBASIC and Fortran.

Sidssoft is designed to run in conjunction with the Sid colour graphics card, one of a range of S100 cards for the OEM user. Sid normally provides 312x290 pixels with eight colours but Sidssoft incorporates a software dithering technique, as used on IBM colour terminals, which is used to increase the colour range to 36. Additionally, up to eight cards can be synchronised to provide 16 million simultaneous colours at maximum resolution.

Sidssoft is now available to all existing Sid card users at a one-off price of £100. As a limited offer it may be obtained as part of the Sid card hardware package for £390.

High Technology Electronics (CW), 303-305 Portwood Road, Portwood, Southampton SO2 1LD. Tel: (0703) 581555.

## Access speeds increased

A 10-MEGABYTE disc has been introduced for the Tektronix 4100 and 4110 graphics terminals. The 5¼-inch 4926 Winchester disc is expected to cut the terminal's dependence on the host computer by storing operating systems and utilities, work files and application programs. It also increases access speeds and data transfer rates for interactive graphics.

Capacity can be doubled by adding an extra drive to the same 4926

cabinet. Also available are dual 5¼in floppy disc drives for the same cabinet. These removable discs could be used for file back-up for the fixed, sealed Winchester discs.

The 4926 connects to an intelligent interface in the terminals. The interface includes a mass storage interface bus.

Tektronix UK (CW), PO Box 69, Harpenden, Herts AL5 4UP. Tel: (05827) 63141.

## BOOKS

## Expanded directory reflects state of software industry

International Directory of Software 1983/84. Computing Publications Limited, £60.

THIS is no lightweight volume in any sense of the word. As the definitive source of information about software and its suppliers, the directory reflects an expanding industry. It is 28% larger than last year's edition, with 1,727 pages and over 2,300 new products listed.

Considerable improvements have been made to the previous indexing system. Instead of a jumbled table of contents spread over several pages, headings are grouped into English, French and German sections, each of which miraculously fits on to a single page.

A similarly logical refinement has also transformed the main body of the book, with tags to mark the beginning of all the major categories, such as "systems software", "applications software" and all their indices at the back.

There are indices of products within their own areas, such as compilers, development aids, CAD or insurance, and these are also listed by industry, of which

banking is by far the largest sector.

Financial software packages account for 30% of the listed application products and there is apparently no quick way to find any particular item. Micro products, which are probably in the majority, are mixed with mini and mainframe systems. The information about hardware requirements is, in any case, at the bottom of each entry.

Another confusing feature (but no fault of the editor) is that so many accounting packages have the same names. There are 19 called "accounts payable" and 17 "general ledger", which would indicate that perhaps closer definitions are necessary, for example a division by hardware manufacturer. IBM would undoubtedly take the lion's share of the space, but micros could be divided by chip for convenient grouping.

Predictably, much of the increased size of the directory is attributable to the micro, especially in the systems software section, which is dominated by suppliers such as Micro Focus and Digital Research.

There are, however, some sur-

prising omissions. Two of the most significant micro operating systems: MS-DOS and PC-DOS from Microsoft are both missing, although they have been on the market for about a year. This is even more surprising when products such as CP/M, which was only formally announced a few months ago, are included.

Versions of Unix, the portable multi-user operating system from Bell Laboratories, are also unpredictably in or out. Xenix, Unix proper, Unity and Uni-Dol, for example, are listed, but not Unix, Zeus, or Onix. Unix also suffers from being split between two sections, with one foot in the mini camp and the other in the mini/mainframe offerings.

However, it is easy to criticise what must be a near-impossible task for the editor. The rate at which new software products are arriving on the market guarantees that whenever the directory is produced it will be out of date before it is printed. Given that fact, it is still undoubtedly the best source of reference information about the software industry.

Maggie McLening

## Understand telecomms jargon

The Penguin Dictionary of Telecommunications. John Graham. Penguin Books. £2.50 paperback.

TELECOMMUNICATIONS is a specialist area that is rapidly attracting widespread interest. Like all specialists, its practitioners use many technical terms that they are not always able to explain very easily when asked.

Graham's dictionary is intended to provide reference definitions for specialists at the same time as explanations for non-specialists. It does this for more than 1,500 terms relating to digital and analogue methods of transmitting voice and data traffic in broadband and narrowband telephone, radio and television systems.

His experience goes back to 1964, since when he has held senior posts in ICL with responsibility for corporate systems, software marketing, technical support and management of the Far East marketing subsidiary. He moved to videotex specialist Aregon International in 1979.

The breadth of his view of the subject is indicated by his definition of the word "telecommunication", which is: "Communication between two people using equipment to overcome the effects caused by distance and/or physical barriers between them. The communication need not be two-way, and the equipment need not necessarily be electronic."

How helpful this is to someone who has felt the need to consult such a definition is perhaps for other dictionary authors to decide.

However, alongside such basic information, readers will be able to find "Not many people know this, but..." stories from entries such as "Phonometry, the name given to studies concerned with the effect upon users of noise interference on a telephone line," or "Despotic network, a network in which the timing of all operations is governed by one master clock. Also known as synchronised network and contrasted with democratic network".

Donald Kennett



## Bridge the gap in the student's experience

Systems Analysis and Design, a Structured Approach. William S. Davis. Addison Wesley. £17.20.

DESPITE widespread acceptance of the structured approach to analysis and design, most of the literature on the subject, as William Davis points out in his book, is aimed at those with experience of the computer industry. This means that a student may fail to see or understand the value of structured techniques, through lack of practical knowledge of the traditional alternatives.

Davis' book is an attempt to bridge the gap in the student's experience by demonstrating these design methods as applied to three different case studies: a payroll, a doctor's office management system and an on-line games and recreation application.

The case studies are sandwiched between an introduction to systems development and 15 "modules" explaining different aspects of design in detail, such as data dictionaries, cost/benefit analysis, HIPO (Hierarchy plus Input/Process/Output) with structured English, Warnier/Orr diagrams and file design.

Generally well-presented, the case studies have sufficient detail to make them into interesting and

convincing projects. Payroll is perhaps an unfortunate choice for an international book, because of the variations in terminology between different countries, but the author's excellent step-by-step commentary, punctuated by thought-provoking questions, should carry the reader over minor discrepancies.

Probably the best study is of the problems facing Dr Lopez, covering all areas of work in a large surgery, from accounting to patient recall reminders. Davis has obviously spent many hours working out the total picture of the surgery, down to stresses caused by the departure of an "indispensable employee", and this pays dividends in the text.

Written to support an initial course in analysis and design for students or for managers merely seeking a grounding in structured techniques, this book strikes the right balance between technical jargon and easily understood explanations, many of which are diagrams.

Like many other potential textbooks, however, it suffers from the frustrating practice of ending each chapter with questions without supplying the answers.

Maggie McLening

## Beginners take a first byte at the home computer

First Byte: Choosing and Using a Home Computer. Mike Scott. Rohan. EP Publishing. £3.95.

FIRST Byte is an extremely attractive book that fractionally falls short of its claim to be the absolute beginner's guide to home computers.

The visual presentation cannot be faulted. There are good colour or black-and-white photographs, drawings or cartoons on almost all the 90-odd pages. The visual quality is matched by a chatty, sympathetic style.

The book starts promisingly. It introduces home computers and what they can do with an enthusiasm that certainly whets the reader's appetite.

But the author then gets bogged down in the jargon that he has

promised to avoid: he describes how a computer works in terms of bits and bytes, flip-flops and ALUs.

Light relief comes with an interesting history of computers from Pascal onwards. But the next chapter, on different types of memory and peripherals, is heavy going for the absolute beginner. It covers everything from disc drives to digitisers.

By chapter five the book is helping the beginner choose a home computer with a list of points to watch for, including which ports are standard, whether speech is available and whether Basic is supplied on read-only memory. This chapter also gives the specifications of popular home

computers with a down-to-earth review of each.

A chapter on programming starts by talking about hexadecimal and machine code, but moves on to a beginner's introduction to Basic programming. This excellent chapter follows the development of a simple program to calculate carpet sizes for different rooms in a house. It shows just how easily users can get a computer to do what they want. The beginner who has persevered this far will rediscover here the eager anticipation generated by the opening chapters.

Overall, despite the lapses into jargon, this book could do a lot of good for the home computer market.

John Kavanagh

## Down-to-earth aims and technical language produce uneasy mix

The Information Technology Yearbook 1983/4. Edited by Dr Philip Hills and Roger Marlow. Century Publishing. £14.95.

THE first Information Technology Yearbook's problem is typified by its dustjacket. "For those outside the organisations concerned with the development of information technology it is an area cluttered with jargon," say the introductory notes. Yet in the next sentence the book is described in terms of "state-of-the-art reports".

These reports are a similar, uneasy mixture of articles that introduce computing to the man in the street yet refer to "software and analogue communications" and to "the CSA", "the NCC" and

"the BOTB" with no indication of what these organisations are.

In addition, because each paper covers a wide subject area few of the articles give much more than a superficial view.

In the paper on information technology in finance, for example, less than two pages of space is devoted to building societies, yet societies are on the verge of setting up a nationwide network of self-service automated teller machines which is likely to have massive implications for the societies and their relationship with banks.

The papers, by knowledgeable government and industry figures, cover Information Technology Year, the ExporIT organisation,

computing, communications, privacy and information technology in education, publishing, finance, the home, work, health care and parliament.

Scattered between the articles are lists of suppliers of an apparently arbitrary selection of products: microcomputers, word processors, software, video equipment, telecommunications equipment and computer-output microfilm products and services. The lists are far from exhaustive.

It is not clear whom this book is aimed at. It could be useful for senior school children, college students and new programmers as an easy-to-read but superficial introduction to computing in society.

John Kavanagh

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COMPEC '83







## EXPERT SYSTEMS

Chris Naylor looks at one of the major problems of the expert system

# What question should the system ask next?

IN THE field of expert systems there is one problem which initially sounds very trivial — until, that is, you sit down and try to develop a good solution to it. This is the problem of: what question should the system ask next?

Consider an example of one of what are the most popular types of expert systems in most people's minds — systems that carry out medical diagnosis. What you want the system to do is simply to diagnose any illnesses which the user at the keyboard might have.

You load the expert system and it proceeds in an orderly fashion asking the user a series of questions and then, eventually, coming up with the correct diagnosis. Easy. It's just like a visit to the friendly, local doctor with the big advantages that the expert system never breaks down, forgets, ignores important evidence or falls asleep. That, at any rate, is the theory.

But turning to the computer itself, the practice is not quite so simple. Unlike a real doctor it cannot just glance at a patient, see that, for instance, he's coughing fit to bust, and ask a few well-chosen questions to get to the heart of the matter quickly.

It isn't that the computer doesn't have the questions in store all ready to be asked. That side of the problem can be solved pretty quickly by a little intensive key-boarding. The real problem is that, unlike the real doctor, the computer doesn't really seem to have much of a clue as to what

question it should ask next.

It can, of course, ask every question in its memory and, if it does so, it should be able to make a very good diagnosis. But obviously, some questions are more important than others and some questions, once answered, tend to lead strongly in the direction of other questions and tend to suggest that some questions are no longer worth asking.

In general, the process of asking questions and receiving replies is a dynamic one. Until recently, the only aspect of the situation that had received much attention was the situation in which the user asks a question of the computer and the computer has to answer. In this case the computer problem is how best to answer a given question (eg by interrogating a database efficiently) and the much more complex question of "which question should be asked next?" is left to the user.

Expert systems have turned the problem around and it is now the computer that has to decide which way the conversation shall go and the user simply has to carry out his or her own personal interrogation or his or her own internal database.

To date there have been three main approaches to this problem, which can be sketched through:

■ The first is simply to "hard-wire" a particular reasoning chain into the program. This is familiar ground. After each input from the user the system knows what it should ask next because the

program explicitly tells it so. This is not a bad method, but very inflexible and very much against the current trend towards knowledge bases.

Given a system which consists of a knowledge base and a driver program to do the reasoning, it follows that an explicitly-coded order of question-asking would become out of date as soon as the knowledge base was altered, which is likely to happen frequently. It also has the disadvantage that it can involve the programmer in doing more work than is desirable. It is much better by far to have a driver program which can work out its own order of questioning without the need for human intervention or effort.

■ The second method is usually called "forward-chaining". In this the program requests an item of data and then, using this data in conjunction with its knowledge base, it makes what inferences it can. At this point it asks the next question on its list.

At its most superficial, all the system is doing is working through a list in order — and this can readily be seen to be potentially inefficient. But at its best it's not as bad as this. For by making inferences from that question, it may be able to rule out certain lines of enquiry before it asks the next question. This means that the next question will be asked from a smaller subset of more "interesting" questions, rather than from the complete set of all possible questions.

In fact, for a point mid-way through a questioning process forward-chaining might seem reasonable. But the worst case can be the matter of the very first question that is asked, for on what basis would the system decide on its first question? Maybe it would simply take the question on the top of a list — a list which might have been pretty casually assembled in the first place.

■ The third method is usually called "backward-chaining" and it is easily the most purposeful method of the three. In this the system considers some hypothesis — a possible diagnosis — and then looks backward through its knowledge base to see what questions it needs to ask in order to ascertain the truth or otherwise of that hypothesis. It then asks those questions until the hypothesis is settled one way or the other.

Essentially a sophisticated method, it is flexible in the sense of being able to adapt to a changing knowledge base and purposeful in much the same way as a

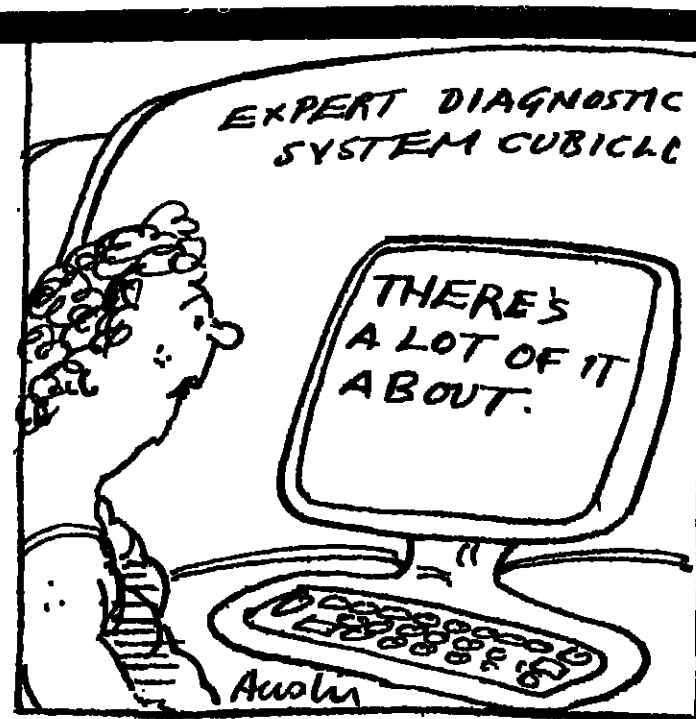
human expert might be. But in this basic form it has two inherent snags.

The first snag is that the hypothesis the system chooses to consider next may not be a very interesting hypothesis out of all those available. And the second snag is that, given some hypothesis, the system might ask a very uninteresting question in an attempt to resolve the matter — there might have been some other, more crucial, question it could have asked first.

Considering the example of medical diagnosis, the first method follows a very sound questioning session but it is inflexible if the knowledge base is changed and involves considerable effort to set it up in the first place.

The second method is flexible and needs little setting up, but the first question it asks might be, for instance, "Do you have clubbed fingers?" (a symptom of some respiratory conditions), simply because that question came at the head of its list of questions.

The third method has the advantages of the second method but, if it asked that some question first (about clubbed fingers) then it might have done so because, say, emphysema was the first diagnosis



on his list (the first hypothesis to be tested). Of the possible symptoms for emphysema, clubbed fingers was the first item on its list of symptoms for that diagnosis.

So none of these methods as they stand are really perfect. Ideally, we want a system which asks, for a start, something like "Do you feel generally ill?" because that is an interesting question to ask in a way that, at this stage, most of the other questions are not.

The problem then is to define, in programmable terms, what constitutes an "interesting" ques-

calculations of this sort, the system can diagnose a wide range of diseases by gradually calling in the evidence.

The question-asking strategy that can now be used is to assign to each item of evidence a "rule value" which is a measure of the extent to which that question is interesting. The question with the highest rule value is that question which is asked next.

For each question (denoted as E — an item of evidence) and for all of the possible diagnoses to which it can apply (denoted as H<sub>i</sub> — one

The system always asks the most interesting question next and its views on what is interesting are continually updated in the light of the incoming stream of information. So the method is flexible, dynamic and always looking for the "big" questions first without wasting time on trivial issues

of several applicable hypotheses(s) we can calculate:

$$RV = \frac{P(H_i|E) - P(H_i|not E)}{P(H_i|not E)}$$

This RV is then a measure of the maximum probability shift that can occur in all of the hypotheses in the knowledge base as a result of obtaining the answer to this particular question.

After each question is asked, the RVs have to be updated to allow for changes in the basic probabilities of the varying hypotheses given the last item of evidence.

Working like this the system always asks the most interesting question next and its view on what is interesting are continually updated in the light of the incoming stream of information.

So the method is flexible, dynamic and always looking for the "big" questions first without wasting time on trivial issues.

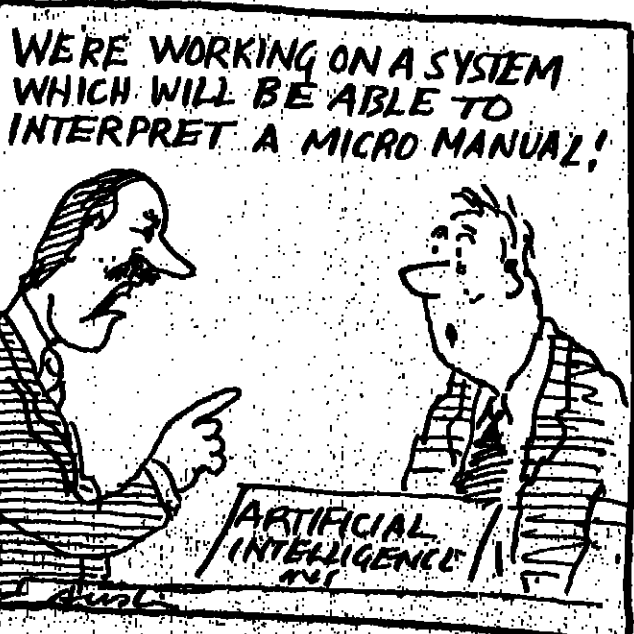
Essentially the method is a probabilistic one, which might make some people feel uneasy about it — but the evidence to date is that it works well in practice.

The main problem is a tendency to "jitter" caused by groups of diagnoses that have applicable rules of questions with similar rule values. So the system first appears to the user to be thinking of one lot of possible illnesses and then switching suddenly to another group of illnesses, and then back again.

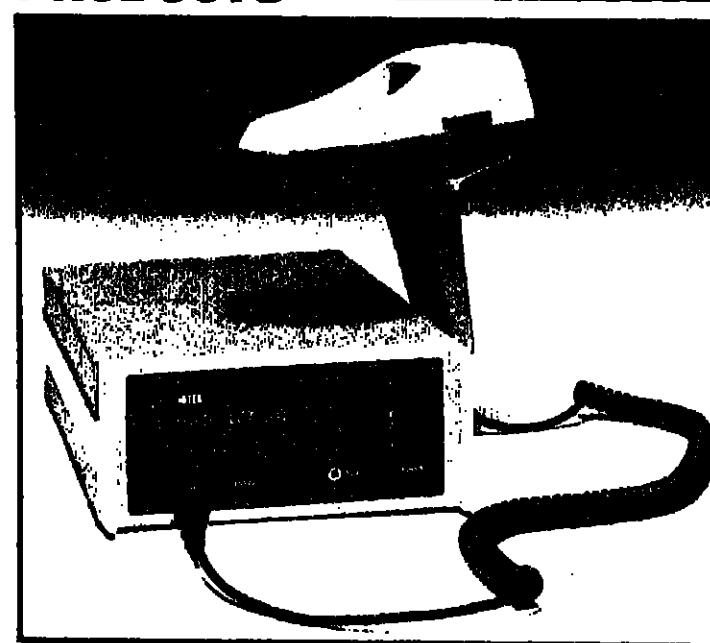
The solution to this problem is to "slut" the rule values with an inertia term, raising the value RV for those questions applicable to hypotheses that were also applicable to the last-asked question. In this way the system contains many of the advantages of a backward-chaining system whilst being, in reality, a much simpler forward-chaining system which also knows just which questions are good ones to ask.

The method contains no explicit chain of reasoning as such but, from the user's point of view, it can certainly be made to look as if it does.

Chris Naylor is a freelance journalist and author of *Build Your Own Expert System*, published by Sigma Technical Press/John Wiley, £6.95.



## PRODUCTS



The 9500 laser reader from Intermec.

## Bar code scanner reads labels from up to 12 inches away

INTERMEC (UK) has announced a laser bar code reading system which allows labels to be read with as much as 12in between the hand-held scanner and the subject label.

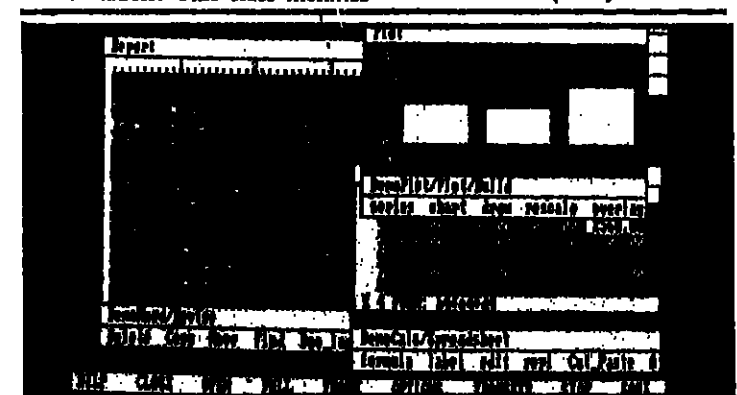
The system comprises two main components: the Laser 1600 Non-Contact Scanner and the Model 9500 Laser Bar Code Reader.

A feature of the Scanner is its physical strength. Intermec has recognised that hand-held devices can and do get dropped. The physical design takes account of this, and all components are shock mounted. An impact absorbing rubber strip surrounds the housing and an optional form-filled rubber moulding can be used for exceptionally harsh applications.

The net result is that the Laser 1600 can withstand a drop of 3ft on to a concrete floor in any orientation, says Intermec.

Other physical attributes are a recessed laser window, and a housing which is sealed to prevent ingress of rain, water spray, dust and oil-mist.

The Laser 1600 copes with "difficult" labels. This class includes



A VisiOn screen with word processor, plotting and spreadsheet windows.

## Support for VisiOn

DIGITAL Research has announced that it will support VisiCorp's VisiOn operating environment as a standard for Digital Research CP/M operating system products. Rapid Terminals, sole UK distributor for all VisiCorp software, has welcomed the agreement.

VisiOn is an interactive, graph-

ics-oriented software environment that allows a personal computer user to run any number of VisiOn and third party applications simultaneously on a single system.

Rapid Terminals (CW), Rapid House, Denmark Street, High Wycombe, Bucks HP11 2ER. Tel: (0494) 26271.

## Fibre optic link is '300 times faster'

TANDEM Computers has introduced a system-to-system fibre optic link that allows the connection of up to 14 Tandem NonStop II systems, each up to a kilometre apart, creating a high-speed information network. Each system can contain up to 16 processors for a total of 224 processors in a local cluster.

Information can be sent and received concurrently across the new link at rates almost 300 times those achieved with conventional dual 56 Kbit communication lines, says Tandem. The fibre optic link is compatible with the company's proprietary Expand networking software, which is used to link nodes more than one kilometre apart.

Designated the Fibre Optic Extension (FOX), the fibre optic link provides a means for high-speed communication among up to 14 systems at a site. Two pairs of transmit/receive fibres are used to achieve full duplex capability and fault-tolerance, making four fibres in all between every two systems on the link.

An extra fibre is included with each bundle of four to facilitate rapid repair in case of fibre breakage. Each fibre optic strand transmits data at a rate of one megabyte per second, for an aggregate serial transmission rate of four megabytes per second. A ring configuration of systems on the link further enhances fault-tolerance, assuring continuous system availability.

Systems connected by the FOX link can also function as part of an extended network of Tandem systems connected by the company's Expand networking software. Expand can link up to 255 systems of up to 16 processors each for a maximum of 4080 processors, with no intersystem distance limitations.

Any data or resource associated with a system on either the FOX link or Expand network is available to all other systems in the network.

"The linking of NonStop II systems at such high speeds can provide more on-site transaction processing power than most large mainframes. Fibre optic technology's so provides many advantages in itself, including freedom from electromagnetic interference, complete electrical isolation, and extreme/low signal loss," said Tandem UK sales director Allen Brain.

According to Brain, "FOX is a system-to-system link that connects NonStop II systems for the purpose of high-speed information transfer. FOX is optimised for applications that demand high transmission rates, and very high system availability and data integrity, such as distributing a database between network nodes."

The price for FOX, including controllers, backplane, interprocessor bus cables, and five fibre optic strands of 100 metres each is £31,500 per node.

Tandem Computers (CW), Tandem House, Mandy Street, High Wycombe, Bucks HP11 2NZ. Tel: 0494-21277.



The Prime 100 micro-based office automation system.

## Prime introduces first of its new workstation series

FIRST in a new line of microcomputer-based workstations designed for integrated office environments, the Prime 100 series, is announced by Prime Computer.

The Prime 100 offers local word processing and mass storage, and access to Prime 50 Series systems. The new workstation will also include proprietary Prime software and keyboard features to enhance its word processing functionality, as well as to promote compatibility with Prime's Office Automation System (OAS) and 50 Series running under Prime's, Prime's single operating system.

"The Prime Product 100 is integral to Prime's distributed office systems support strategy," said George Kendall, marketing director. "Supported on the full line of Prime 50 Series systems, this workstation provides the powerful functionality required to integrate the larger office."

The unit is a desk-top model comprising a powerful 16-bit Intel 8086 microprocessor CPU, 384 Kbytes of main memory, detachable keyboard, 15-inch video display terminal and local mass storage.

The new office workstation features two 5 1/4in mini-floppy diskettes and drives with a capacity of 630 Kbytes. Mass storage options include a 5 1/4in mini-Winchester hard disc with capacity of 5, 10 or 16 Mbytes.

The 80-character x 28-line video

display tilts 10-30 degrees operator comfort and features green phosphor anti-glare screen with brightness control. The key typewriter-style detachable keyboard has been ergonomically designed by Prime. It is connected by a coiled cord, extendable to the workstation.

Prime Product 100 word processing software is described as a powerful, easy-to-use document-oriented system permits migration to the workstation for current OAS customers.

Using split screens, the processing software enables user to view and edit up to documents at the same time, allows easy editing, moving, copying of information from document to another.

Other enhancements include Help screens at every level to guide quick, efficient user assistance without continual recourse to manuals, integration with host-based electronic mail and other OAS functions such as electronic filing and appointment scheduling, for office automation function and an Undoredo function allow easy recovery from key mistakes.

Prime Computer (UK), The Hounslow Centre, 1 Linton Road, Hounslow, Middlesex TW3 1JB. Telephone: 07400 7400.

free hammer mechanism. This results in minimal wear.

Memorex (CW), Memorex House, Church Street, Staines, Middlesex. Tel: Staines 5148.

Said to use half the power consumption and space requirements of the IBM equivalents, the Memorex printers have a friction

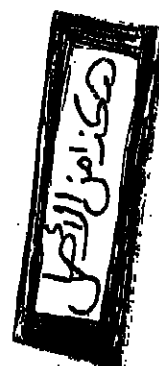
A 1200 lpm printer.

The MSLI-RM11 disc controller.

A 1200 lpm printer.

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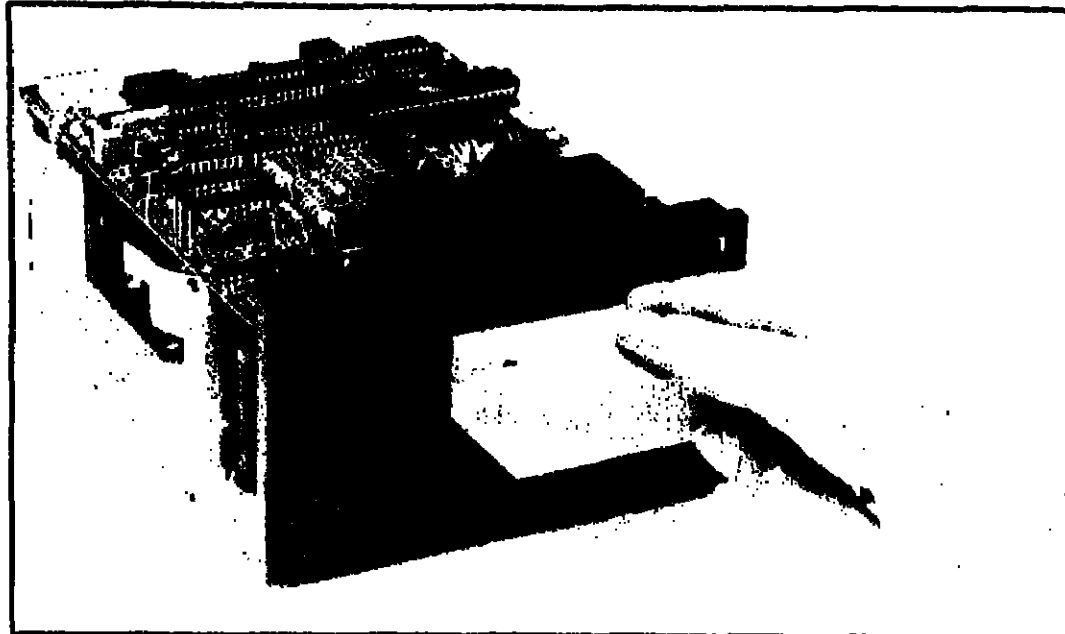
Wembley Conference Centre.  
March 13-15, 1984.

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For more information contact: The Exhibition Sales Manager, The Computer Trade Show, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telephone: 01-661 3125

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The TM951 1/2in streaming tape drive from Tandon Corporation.

## 50 Mbyte streaming tape drive

STREAMING tape drives with storage capacity of 50 Mbytes that physically fit the form factor of 5 1/4in disc drives have been introduced by Tandon Corporation. The TM951 tape drive is physically compatible and electronically similar to both standard 5 1/4in flex-

## Addition for the Prince

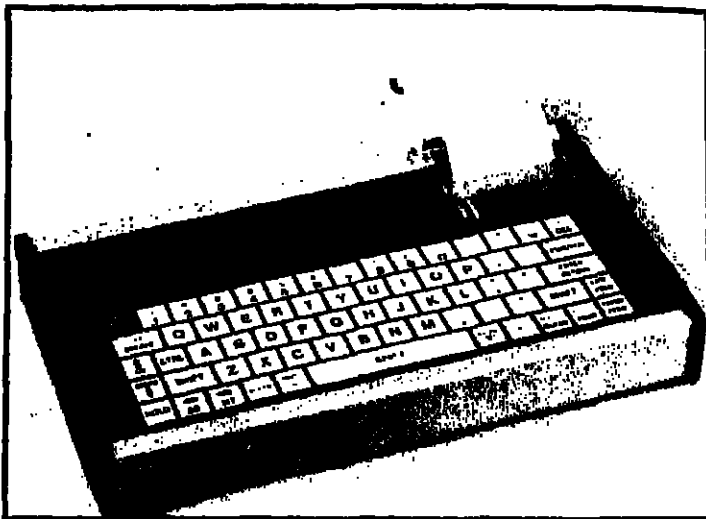
THE IBM 3780 communications protocol has been added to the Prince microcomputer by UK manufacturer Digico. The machine, which runs under the CP/M operating system, can communicate with IBM machines and other mini and microcomputers using the 2770, 2780, 3741 and 3780 protocols.

Prince users with IBM mainframes can therefore prepare batch data locally offline, access mainframe files and run local processing using any of the 4,000 applications packages available under CP/M.

As a remote job entry terminal a Prince can handle IBM 3270 functions such as screen formatting, data link control, time out control, cyclic redundancy checking and response polling.

Prince local area networks can in addition allow several separate users to share common local resources such as disc drives and printers.

Digico (CW), Spanverne House, 32 York Road, Leeds LS9 8TD. Tel: (0532) 486688.



The TransTerm 3 from Technical Designs.

## Direct dial to computer

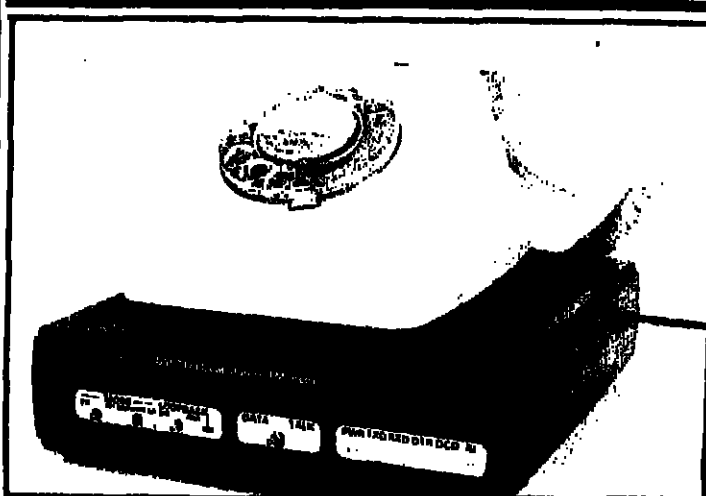
MANAGERS and salesmen can dial their office computer direct from any telephone via a new acoustic coupler on TransTerm 3. This innovation in portable terminals, available from Technical Designs, has a non-volatile memory and full sized keyboard.

With TransTerm 3, orders can be placed directly, or the user can ask the computer for an update on stock levels or prepare and send messages and other data. Informa-

tion transmitted back is recorded on the TransTerm printer.

Priced at £368 for a single unit, TransTerm 3 is powered by a rechargeable battery. No bigger than an average book, it can be used like an electronic notebook in any situation outside the office, factory or retail operation, says Technical Designs.

Technical Designs (CW), 2 Albion Way, Biggleswade, Beds. SG18 8BN. Tel: (0767) 312470.



The Dacom Systems DSL2123 dual standard modem.

## Dual standard modem

A DIAL-UP dual standard modem from Dacom Systems is aimed at the cost-conscious minicomputer user who will be able to access databases operating at 300bps or 1200/75bps (viewdata speed).

The new modem, the DSL2123, conforms to both CCITT V21 and V23 standards. It operates in four different modes: 300bps full duplex, 1200bps half duplex, 1200/75bps (viewdata terminal end) and 75/1200bps (viewdata computer end).

The DSL2123 is available in a compact unit for desk-top use or in a high density rack mount version. The desk-top unit fits under a telephone and is small and light enough to be carried in a briefcase.

The rack mounted version saves space with up to 24 units mountable in a 5U 19in rack frame. It is also available in a card only version for OEM applications such as for personal computers and terminals.

Features of the new modem include auto answer, in-built diagnostics and full signal indicators. The use of LSI technology results in a very low component count. It is approved by British Telecom for direct attachment and, in V21 mode, is compatible with another recently introduced Dacom product, the CCITT CAT acoustic coupler.

Dacom Systems (CW), 200 Cornhill Road, Milton Keynes MK14 7AH. Tel: (0908) 676797.

## Sick pay package

A STATUTORY sick pay package for IBM System 34 and System 28 computers has been launched by the UK services group CMG.

The SSP34/38 system keeps full details of all absences and logs information employers must maintain to comply with the new legislation. This information includes dates and details of sickness absence, details of payments and dates when sick pay was not paid, with reasons.

At company level the system works out weekly sick pay, transfers and exclusions, with full details, total payments by period and year-to-date, sick pay week-ending dates and patterns of qualifying days.

At employee level its calculations include daily and weekly payments, daily and weekly rates.

CMG Information Services South East (CW), Sunley House, Bedford Park, Croydon CR0 2AP. Tel: 01-686 8251.

## BBC micro extension

AN extension card for the Acorn BBC microcomputer has been introduced by Control Universal to give access to up to a megabyte of memory and to a wide range of external devices.

Beeb-Ex is an interface card which links to the microcomputer's bus port under the case. It provides links to Acorn's Euro-cards and to Control Universal's own Cube range of over 30 external cards.

Typical external links include extra digital input and output channels, eight-bit or 12-bit analogue interfaces and extra memory. Beeb-Ex comes as a self-contained unit holding up to five Euro-cards and costing £49 or as a component slotting into a standard rack-mounted system of up to 14 backplane connectors.

Control Universal (CW), Unit 2, Anderson's Court, Newnham Road, Cambridge CB2 9EZ. Tel: (0223) 358757.

# APPOINTMENTS

Computer Weekly  
Classified Department  
Quadrant House  
The Quadrant  
Sutton  
Surrey  
SM2 5AS  
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Consultancies: 01-861 8787  
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Steve Lever  
01-861 3104

General copy deadline  
3.30 pm Monday prior to  
Thursday publication  
Senior Appointments  
4 p.m. Friday prior to  
Thursday publication  
Colour deadline  
4 p.m. Friday prior to  
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18 x 3 cols £1470  
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Box nos. £5 extra. Address back to c/o Computer Weekly, Classified Dept., Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS.

# THE Hunterskil Group

## CONTRACTS

**SEL**  
**Brussels**  
**Programmers and**  
**Systems Programmers**  
With SEL MPX32 Assembler or Fortran  
**Equiv. earnings**  
**£20- £25K per annum.**

Start dates: between July 1983 to November 1983.  
Contract duration: 6 months to 11 months.

Our client, a systems house, is facing a period of rapid expansion and require personnel with strong SEL experience to join their development team and work in a high level technical environment.

Should you be interested in this opportunity to work overseas for a successful expanding company please telephone **Elaine Collis.**

**IBM-PL1**  
**Saudi Arabia**  
**£20,000-£27,000 Tax Free**

**PL1 + COBOL - TSO/SPF A/Progs**  
**PL1 + COBOL - IMS DB/DC**  
**A/Progs or Systems Analysts**  
**PL1 Training Instructors**

One year renewable contracts.  
Start date Aug/Sept onwards.  
Package includes accommodation, flights and other benefits. Please call Richard Kaluzynski for further details.

**HUNTERSKIL**

Hunterskil International Limited

14 Old Park Lane, London, W1Y 4NL

**01-491 4706**

D of E Reg No SE/A 1015

## CONTRACTS

### Systems & Programming

**PRIME + COBOL Programmers**  
Immediate start 3-6 months commercial applications under PRIMOS.

**MICRO BASIC Programmers**  
ongoing contracts for software company from 3 months +.

**TANDEM**, immediate requirement for contract programmers with ANSI COBOL & PRT-HWY.

### Operations

If you are available now or soon please register for various contracts on the following:  
**MVS, HP3000, DOS/VSE, JCL Writing, IBM Conversions.**

**Immediate start**  
**MVS JES2 JCL Writers.** Various locations.

**Data Entry Sales person**  
I have not yet set up this division but am willing to speak to you if you feel you could take on the challenge. Good basic and initial guarantee for the right person.

We specialise in the Banks, Hotels, Supermarkets & Surrey areas. If you are interested in contracting in the Thames Valley or already on contract here, give us a call or send your CV - you could find us very rewarding indeed.

Phone me, Nick Gill in Maidenhead.

**HUNTERSKIL SOUTH**

Specialist Computer Staff

Chatsworth House, The Broadway, Maidenhead, Berks, SL6 1LY

**(0628) 75551**

D of E Reg No SE/7398

## CONTRACTS

### Systems & Programming

**IBM CICS, DL1 - Hartfordshire**  
Programmers to work for 6 months on IBM 4341 DOS/VSE, commencing Mid July. Ref: Bridget 1038

**RADAR + Assembler/Fortran - France**  
Senior Analyst required for RADAR applications on an IBM 4341 using VM/CMS and MVS - 12 months + duration. Ref: Bridge 1104

**IBM MVS Systems Programmer - Brussels**  
Experienced systems programmer required with skills in MVS, JES2 - long term contract. Ref: Elaine 1042

**INTEL 8086/CORAL 66**  
Systems Designers - London, Programmers - NW England  
Systems designers required to work on the design of a real time defence system. Experience of MASCO, graphics, comms, distributed DB, or defence applications advantageous.

Also seeking good CORAL 66 programmer with experience of INTEL and real time systems. Contract duration 6 months. Ref: Elaine 1087

**Datapoint RMS/DOS - Norfolk**  
Urgent requirement for a DOS to RMS conversion, good opportunity for Databus programmers to learn RMS. Ref: Suzanne 1089

**ICL VME IDMS & TPMS - Project Manager and Team Leader**  
For the Project Manager position, starting in August, the emphasis is on Management experience. The Team Leader, starting July, will require a Design background. Ref: Suzanne 1030

**ICL - UK & Overseas** We have various requirements for:  
VME COBOL, TPMS, IDMS, 2856 DME GEORGE II + COBOL, TP Analyst/Programmer 1800/2800 DME GEORGE III, System 25 Assembler, IDMS - Database Designer, A.S.A.P.

**DG NOVA/ECLIPSE** DOS/ACS COBOL, BUSINESS BASIC - Midco. Ref: Suz 1032

**PRIME S/W Support, 1 year - Kuwait.** Ref: Suz 1039

**UNIVAC 1100 COBOL/TIR** Ref: Suz 1106

**BURROUGHS CMS, A.S.A.P.** Ref: Suz 1077

**DRS CIS COBOL - All areas.** Ref: Suz 1062

**Knight Computer Services Limited**

Specialist Computer Staff

14 Old Park Lane, London, W1Y 4NL

**01-491 4706**

D of E Reg No SE/A 1014

# THE Northern Computer Fair

Personal computers  
Home computing  
Small business systems

Sponsored by:

Practical Computing and YOUR COMPUTER

The right place . . . . . The right time

Following the successful running of the 1982 Northern Computer Fair, the organisers announce that an even bigger and better show will be held again this year at Belle Vue, Manchester, from November 24-26, 1983.

This is the UK's premier exhibition for the rapidly expanding home and small business computer market, featuring a wide range of equipment, software and services. It is a must for all computer enthusiasts and the rapidly growing industry of personal computers, home and small business systems.

Main entrance to the fair is via the main entrance to the fair, which is the main entrance to the fair.

Belle Vue, Manchester, November 24-26, 1983.

**THE Northern Computer Fair**

I am interested in exhibiting.

Name

Position

Company

Address

Telephone

The Exhibition Manager, Northern Computer Fair, Reed Exhibitions, Surrey House, 1 Theobald Way, Sutton, Surrey SM1 4QQ



**"There are few projects in computing that can match the variety provided by Birmingham City Council**

**and we have the equipment to meet the challenge with an IBM 3033 and over 400 terminals"**

Birmingham City Council, the largest city authority in England, serves a population of over 1 million with a diverse commercial and industrial community. The City Treasurer's Department has responsibility for over £700m expenditure p.a. on capital and revenue account and playing a vital role in the Department's activities is the purpose built Computer Centre. The Centre operates an IBM 3033 with 13,000 megabytes of backing store to support over 400 terminals with a further 200 planned. The next phase of the City's Development Plan is taking place which has created a number of opportunities for professional computer personnel to work on a wide selection of applications.

There are few developments in computing that can match the variety provided by the work of the Council from Education and Property to Planning and Social Services involving large data base systems and incorporating on-line processing facilities.

**We require now:-  
Information Centre**

**ANALYST PROGRAMMERS**  
**£11,859 p.a.** (Ref. CD12)

These posts lie within the Information Centre, a team advising and assisting users in a wide range of projects involving micros, minis, word processors and mainframe personal computing. The holders of these posts will be those having systems analysis experience plus a good knowledge in these areas. Knowledge of a large IBM mainframe, with which much of this equipment will require to communicate, will be considered advantageous.

**Applications Development  
SYSTEMS ANALYSTS**  
**up to £11,859 p.a.** (Ref. CD7)

To develop applications (financial and non financial) and work with the minimum of supervision.

It is unlikely that the persons appointed will have less than 3 years' systems experience.

**CHIEF PROGRAMMER**  
**up to £12,174 p.a.** (Ref. CD8)

Applicants would be responsible for controlling a programming team working initially on the City's Direct Labour Organisation Systems. He/she must have a high level of technical expertise, proven qualities of leadership and the ability to utilise resources to their best advantage.

**SENIOR PROGRAMMERS**  
**up to £11,184 p.a.** (Ref. CD9)

Applicants will require experience of specifying, designing, writing and testing COBOL programs in either a GEORGE 3 or OS/MVS environment. Experience in supervising others would be an advantage.

**PROGRAMMERS**  
**up to £9,231 p.a.** (Ref. CD10)

Applicants should have experience of designing, writing and testing COBOL programs in either a GEORGE 3 or OS/MVS environment.

**Technical Support  
Group Staff**

**JUNIOR  
SYSTEMS PROGRAMMERS**  
**£5,352 - £9,231 p.a.** (Ref. CD11)

Candidates should have significant IBM programming or operating experience. Suitable general training will be given before the successful candidate is assigned for specific training and experience under the supervision of a senior systems programmer in one of the following areas: Data Base, Operating System/Personal Computing, Communications Network, Service Support.

Good terms of employment include flexible working hours based on 36½ hour week, assistance with relocation in approved circumstances. Pay award pending.

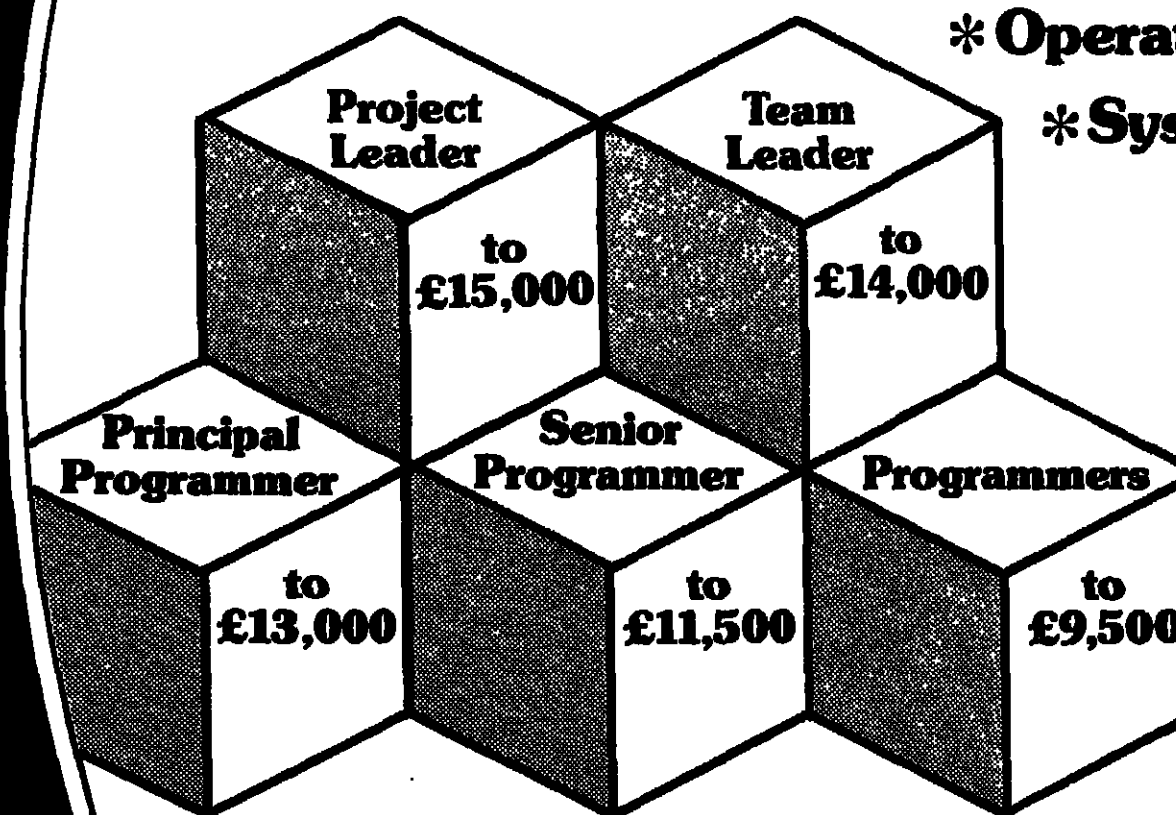
For application form candidates should apply to:-  
**City Treasurer (Ref: PSO), Council House,  
Birmingham B3 3AB.**  
**Telephone: 021-235 2993/2385.**

Canvassing will disqualify.  
*An equal opportunity employer.*

**BIRMINGHAM CITY COUNCIL**

**Let us build our future together**

**\* Operating Systems \* Compilers  
\* System Testing \* Integration**



Do you consider your career development as something worthy of the most careful planning? We naturally believe that you do and are convinced our client can more than match your expectations. Whatever the next position is in your career plan, our client can promise you satisfying and rewarding long term career prospects.

Due to continued expansion several vacancies have arisen within a section of a large computer engineering development group, where there is a range of projects covering a wide spread of activities mainly aimed at the development of sophisticated operating systems and language processors. We require experienced software specialists who are creative and innovative. At senior levels we would expect candidates to be capable of providing technical design leadership in operating systems software, or compilers. Essentially we would be interested to hear from any candidates with a systems software background who wish to build the next level of their career. Our client occupies a leading position in the design, development and manufacture of mini computer systems which are installed throughout the world. They can offer you the benefits of a large company with the attraction of variety and scope to suit your talents. The company operates a contributory pension scheme, 25 days holiday and offers generous relocation assistance where necessary.

Evenings and week-end telephone numbers:  
**Terry Harvey: Gt. Missenden (02406) 4705**  
**Brian Cones: Chesham (0494) 785722**

**HR**

**H. R. Associates Limited**

Executive, Computing and Technical Personnel Consultants  
57a Hill Avenue, Amersham, Bucks. HP6 5BX Tel: 02403 28383  
London office: Regent Street W1

**HR**

**SOFTWARE ENGINEERS**

In the fast-moving world of intelligent guided weapon systems, our client's high-integrity built-in software has a definite edge on the competition. As a software house, they are setting their own ambitious targets, and are presently initiating a major research and development programme.

They have introduced the latest VAX systems and powerful real-time minicomputers. This dramatically enhanced capability signals important openings for experienced Software Engineers who can make a positive contribution at this early stage.

In all cases you should have a degree-level qualification in a science, engineering or computing field; preferred experience is in real time software development using the host-target concept, with CORAL/MASCOT, or in real-time simulation.

**CONSULTANTS c£17,000**

With at least 10 years' experience in developing significant real-time software and/or support environments, you will be expected to produce both conceptual and practical design solutions as well as directing a number of software engineering groups.  
**Ref No: W756.**

**PRINCIPAL SOFTWARE  
ENGINEERS c£14,000**

Operating at conceptual design level, you'll need to be a natural leader with in-depth expertise in at least one

software specialisation (real-time software design, support environments, simulation, etc.) built up over 8-9 years' professional involvement with both high and low level programming techniques and languages. **Ref No: W755.**

**SOFTWARE AND SENIOR  
SOFTWARE ENGINEERS £9-13,000**

Working to clearly-defined functional requirements with a mixed team of engineers, you will design, develop and prove real-time software at group or individual module level. At least 3 years' appropriate experience is required using high level structured programming languages. **Ref No: W754.**

In addition, there are vacancies for Software Engineers/Designers at all levels, for real-time simulation, requiring appropriate experience on SEL/VAX and FPS array processors. **Ref No: W758.**

Positions offer fully negotiable salaries and a first class relocation package will be available, where appropriate, to candidates for assistance in moving to this pleasant part of the Northern Home Counties.

For further details, interested applicants should write or phone OCC Computer Personnel, quoting appropriate reference.

**Homing in  
on the software  
challenge  
of intelligent  
guidance**

**01-242 9356 occ computer personnel**

24 hour answering service.

Recruitment Consultants: 16 Bedford Row, London WC1R 4BB



# LONDON AND THE HOME COUNTIES MIDLANDS

## WEST LONDON

ANALYST/PROGRAMMER

This international pharmaceutical company are currently developing major new On-Line commercial systems on their large IBM mainframe. You can help if you have a strong COBOL/CICS background, preferably gained in a DOS/VSE environment. This is a full-time position with a quickly expanding department. Benefits include THREE salary reviews per year, relocation expenses where applicable and free family BUPA.

## ADF - IMS DB/DC

ANALYST/PROGRAMMER/DESIGNERS

One of the world's largest expanding consultancies urgently require additional professional expertise to supplement their already vasty experienced teams. If you have had some experience in ADF in an IMS DB/DC or any other related environment, and would like the chance to grow with this company, call me, SIMON KONING, now and I will discuss this unique opportunity with you.

## DEVELOPMENT WORK

PROGRAMMERS PLUS

City-based company using DEC and VAX require knowledgeable BASIC, C, and Fortran programmers who could also be experienced in systems support or technical support. As candidates will be judged on their relative merits and practical experience we have been asked to short list any suitable candidates. You will need a degree or degree equivalent, a responsible outlook and an ambitious and confident attitude. This company offers good benefits and a most pleasant and friendly working atmosphere.

## ANALYST PROGRAMMER

INSURANCE

A major insurance group require an additional member for their development team. We are looking for experience gained in a DOS/VSE, VMS, CICS-COBOL environment and the confidence to grow with a rapidly expanding department. Our clients offer every opportunity for advancement and training together with a range of benefits commensurate with a major employer.

## URGENT REQUIREMENTS

LONDON & HOME COUNTIES

CONSULTANTS, BUSINESS ANALYSTS, Financial £15-£20,000  
CIC 2800 DME VME TPS TOTAL, ALL LEVELS.  
C7-£14,000 - Survey  
IBM COBOL PROGRAMMERS, 1 year's experience, £8,000+  
SYSTEMS PROGRAMMER DOS VSE CICS, DLI, BANKING  
DEC RSX11M, MACRO, ALL LEVELS, £7-£17,000 -  
London  
MVA SYSTEMS PROGRAMMERS, TRAVEL £20,000 Package  
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Programmers £10,000 - KENT  
IBM DB and DC ANALYST, Insurance £14,000+  
ICL 2900 DME, VMS, COBOL, Systems Analyst £11,000 - WEST  
END

## TECHNICAL PRODUCTS MANUFACTURER

PROGRAMMERS TO PROJECT LEADERS

A highly successful world leader in sophisticated technical products, situated just outside London, is currently faced with a staff crisis. PROGRAMMERS, SENIOR PROGRAMMERS, and PROJECT LEADERS are required. Knowledge of HP 3000 and/or systems, order processing, production control, financial and commercial applications would also be useful. An exciting prospect with excellent salary and a full range of benefits including relocation can be offered.

## INTERNATIONAL BANK

PROGRAMMERS X 2

£11,000 + NORMAL BANK BENEFITS  
Have you always wanted to work in a financial institution, and have a sound COBOL background gained in a large IBM environment to DLI or any other database and have gained some experience in banking, then call us now, as opportunities in Banking do not appear very often.

## ANALYST PROGRAMMERS AND PROJECT LEADERS

To £20,000 PACKAGE

Due to a policy of carefully controlled growth, these clients require a number of additional members of staff this year. They have been extremely successful in designing and installing systems based on the IBM GSD range and require some RPD experience (any machine) together with a flexible, mature, and professional approach. Superb opportunities are offered, working with Blue-Chip customers.

## FINANCIAL COMPANY

CICS TRAINING

This is not an idle promise FACT!! This well-known stockbroking company will, with the right person in CICS if you have around two years' COBOL programming experience gained in a large IBM environment. Some exposure to On-Line systems would be an advantage but is not a pre-requisite. This is an ideal opportunity for someone working in a large batch environment, and would like to move into a more technical and demanding position.

## HEALTHCARE SYSTEMS

PROGRAMMER

A developing company require a young and ambitious COBOL/BASIC programmer to complement an existing efficient team based in the West End. Currently using DEC and VAX the candidate will need to be familiar with financial and payroll systems. A minimum of 18 months' experience is required. This is an exciting prospect with excellent salary and a full range of benefits including relocation can be offered. This is an Assurance, Pension, Season Ticket Loan, etc. Please contact MARSHALL CLIGMAN at our London office.

## OPPORTUNITIES IN PL/1

ALL LEVELS

We are continuing to take in a number of vacancies for people with PL/1 experience at all levels. Our client base includes CONSULTANCIES, INSURANCE, BANKS, INVESTMENT and MANUFACTURING concerns based in the CITY, GREATER LONDON and all the HOME COUNTIES. If you need a change of scene contact TARGA immediately. MORTGAGE assistance is available in some cases.

## GSD ANALYST/PROGRAMMER

OXFORD

A leading manufacturer in the light vehicle industry, is seeking a mature Analyst Programmer for their new installation, with experience of RPD on an IBM 534. Major developments are being undertaken in the area of manufacturing systems and we are looking for a sound Programmer with good analysis and communication skills. Relocation expenses will be considered.

## ANALYST

COVENTRY

Our client is a leading Software House in the Midlands. Due to continued expansion they require to take on another support Analyst. You should be able to demonstrate good Analysis experience on integrated Mini computer systems with some experience of BASIC however limited. Prospects with this company are excellent.

## SOFTWARE HOUSE

SUTTON COLDFIELD

A family business, this company is looking for an ambitious Programmer to join them. They are seeking a Programmer with DEC PDP 11 or DEC VAX experience, preferably with knowledge of REXX, though this is not essential. You should be able to demonstrate a sound knowledge of BASIC + 2 and have the ability to take on analysis roles in the future.

## PROGRAMMER

COVENTRY

We are looking for several COBOL programmers with two years' experience. You should come from either a manufacturing environment or a Software House and have experience of integrated Mini computer systems. The company has an over-flowing order book, and several fringe benefits are offered in addition to the salary.

For a discussion outside of office hours, phone 0787 280748 or 01-688 3818. Messages regarding Midlands-based positions can be left on 01-622 3566.

## Somerset County Council EDUCATION DEPARTMENT

Information Technology Centre  
Somerset College of Arts and Technology  
French Weir, Taunton

## SENIOR SUPERVISOR AND FOUR SUPERVISORS

Required as soon as possible for a new Information Technology Centre.  
The Centre which is sponsored by the Somerset College of Arts and Technology under the new Youth Training Scheme, will be largely funded by the Manpower Services Commission with assistance from the Department of Industry. The aim of the ITEC is to provide skills training for 30 trainees in general areas of computing, electronics and microprocessors relevant to technical and business applications.

**POST 'A' - SENIOR SUPERVISOR**  
The salary for this full-time (37 hours per week) post will be £8,848 per annum.

The person appointed will assist and deputise for the Manager in the operation of the Centre; participate in the training and work of the trainees as an active instructor; and advise and counsel staff and trainees.

**POST 'B' - SUPERVISORS**  
The salary for these full-time (37 hours per week) posts will be £7,311 per annum.

The four supervisory posts will be:  
Supervisor - Equipment/Electronic Skills  
Supervisor - Keyboard/Office Skills  
Supervisor - Hardware/Software  
Supervisor - Software/Hardware  
The persons appointed will be responsible for the implementation of the established syllabus and training programme, including instructing the trainees in training and work activities. Applicants for all these posts should have relevant and recent industrial qualifications appropriate to the posts and to skills training activities. Teacher training qualifications would be an advantage.

**PRIORITY WILL BE GIVEN TO UNEMPLOYED APPLICANTS**  
Application forms and further details available from the Chief Education Officer, Staffing N.T. Section, County Hall, Taunton (stamped addressed envelope please, clearly stating which post desired).  
Closing date: 22nd July, 1983.

## GRAMPIAN REGIONAL COUNCIL

### (A) ASSISTANT DIRECTOR - COMPUTER SERVICES

(£15,432-£16,536)

### (B) SYSTEMS DESIGNER/ANALYSTS (2)

(£10,770-£12,417)

### (C) LIAISON OFFICERS (3)

(£10,770-£11,718)

These new posts, the first group of a series proposed in a review of the systems and development function, offer opportunities to be in at the start of a restructured Department, already well established but needing to provide a wider range of facilities and services in greater depth to its many users.

Post (A) (Ref. 426/83CW) requires substantial experience at a senior level with a successful record of new systems implementation, staff motivation and user liaison management. Posts (B) (Ref. 426/83CW) need experienced systems designers/investigators with COBOL programming background and thoroughly conversant with batch and communications work.

Posts (C) (Ref. 427/83CW) are to help in problem investigation, systems proposals, guidance and advice to users and monitoring of installed systems. Applicants could have backgrounds of O/R, O & M or computer systems work.

Informal enquiries to Mr R. E. Ellis, Director of Computer Services (Tel. Aberdeen 68222, ext. 3285). Applications, in TYPED FORM, giving full details of relevant qualifications, age, experience, present employment and salary together with names and addresses of three referees should be lodged with Director of Manpower Services, Woodhill House, Aberdeen, by 11.00 AM on 26 July 1983. There is no application closing date for posts (B) and (C) but applications for post (A) should be lodged NOT LATER THAN 22 JULY.

(4634)

## SOFTWARE ENGINEERS FOR HOLLAND

Experience in any of the following: Data Comm, BSC, SDLC, 3270, 8086, 8085 or 8080.

Short- and long-term contracts are available up to £800 per week.

We will also have a requirement for a

## TECHNICAL WRITER

in a few weeks. Salary similar to above.

Send your c.v. to:  
MICROSYSTEMS ENGINEERING LTD.  
8 South Tay Street, Dundee, or  
Telephone Amsterdam 237245 for further information

(4637)

## SYSTEMS ANALYST SALARY NEGOTIABLE

Our client is a successful International Company which manufactures and markets supplies for the construction industry. They are looking for an experienced Systems Analyst with the following credentials:

- ★ Two years' Systems Analysis plus some programming experience
- ★ Familiar with Database and Realtime systems
- ★ Practical product/commercial background
- ★ Capable of communicating at all levels of the company
- ★ Willing to work in a dynamic environment of changing structures and responsibilities

Please apply in writing to: Burroughs Machines Ltd., Systems Services Centre  
4 Copthall House, Eaton Road, Station Square, Coventry CV1 2PP

# SOFTWARE QUALITY ASSURANCE

To: S.E. BERKS

Berks

Our client, an international minicomputer manufacturer, is enjoying a dramatic growth in sales due to innovative design and exciting business plans. Continued success depends on exacting quality assurance of new software releases, and to this end we are recruiting an additional Senior Software Quality Assurance Analyst.

The successful candidate will be well versed in software quality assurance, have sound software systems and programming experience and proven interpersonal communications skills. He will also have software test plan development and execution experience with a software functional specification and design review background.

In return you will enjoy a challenging project leader position with a team of analysts, and the opportunity to grow with this continually expanding group.

For further details please telephone Keith Taylor at our Reading office (0734) 595346 or write enclosing a full C.V.

MCL

McCOURT COUSINS LTD.

27-29 Greyfriars Road,  
Reading, Berkshire  
Telephone (0734) 595346 (24 hours)

Chesham House, 150 Regent St  
London W1R 5FA  
Telephone 01-439 6288

## RSX11M

TEAM LEADER ANALYST/PROG.  
To £14k + relocation To £12k + relocation

S.E. BERKS

Our client, a highly successful industrial control specialist is expanding. Large dual computer systems with colour graphics and specialized micro-processor interfaces are extensively used.

This continued expansion has led to a further need for a team leader and analyst programmer.

For the more senior position you must have at least 4 years real-time experience using Macro 11 and a block structured language. Familiarity with RSX11M is essential. In addition a knowledge of INTEL or ZILOG equipment would be advantageous. Analyst Programmers will have at least 2 years similar experience.

You will enjoy access to an abundance of the latest development equipment, good career prospects, frequent user liaison and work in a small friendly community.

For further details telephone Keith Taylor at our Reading office or write sending a full C.V.

MCL

McCOURT COUSINS LTD.

27-29 Greyfriars Road,  
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London W1R 5FA  
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# USE YOUR SKILLS IN IMS/NOMAD DEC VAX/HP 3000/FOCUS/SYSTEM 38

A career with Tangent in UK, EUROPE and the MIDDLE EAST

Tangent means success in the software world.

In just nine years, we have grown into a respected force in the international systems and software world. With offices and work locations around the globe, our services are in high demand by many major commercial organisations.

Against this background of success, we now wish to increase our technical strength in our professional services division. We wish to recruit experienced computer professionals seeking a challenging future, combining technical and career advancement into project management and beyond.

Currently we need:

- PROGRAMMING CONSULTANTS
- SYSTEMS DESIGNERS
- ANALYST/PROGRAMMERS
- DATABASE DESIGNERS

We would like to meet you if you have a minimum of two years' experience in Data Processing with at least one year's experience in the above technical areas.

Our career package is very attractive and benefits include:

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- ★ Non-contributory pension
- ★ Comprehensive medical and insurance scheme
- ★ Company car after six months

To find out more telephone Susan Buchan on Romford (0708) 750201 or write to Tangent Computer Services Ltd., 102/108 South Street, Romford, Essex RM1 1RX. Tel: Romford (0708) 750201 (24-hour answering service).

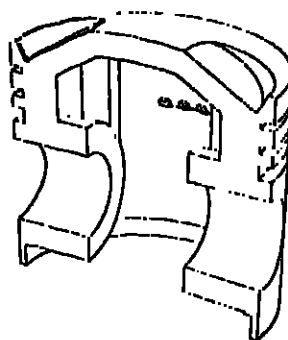
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SUCCESS IN THE SOFTWARE WORLD





## SHAPE DATA LTD. CAD/CAM Software



Rapid expansion of the Company's activities has led to the creation of new posts at both senior and junior levels. Opportunities exist for:

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Both Experienced and Newly Graduated for:

- DEVELOPMENT of software tools, geometric modellers, interactive systems, graphics, and engineering drawing generators.
- CUSTOMER SUPPORT where the activities include quality assurance, porting software, handling bug reports and giving training and advice to customers.
- WRITING USER MANUALS which requires candidates to combine writing skills with a CAD/CAM background.
- VAX SYSTEMS A programmer well-versed in VAX/VMS is required to take responsibility for two VAX 11/780s plus other computers and graphics equipment, to tune and develop its system software, and to play a major role in planning new acquisitions.

Shape Data produces state-of-the-art software for mechanical engineering design and manufacture based on complete solid model product descriptions.

If you have a background in computer science or another technical subject and would like to be considered for a job in a stimulating, friendly environment located in central Cambridge and with a very competitive salary please write enclosing your CV to:

Dr C. A. Lang, Shape Data Ltd,  
2 All Saints' Passage, Cambridge CB2 3LS

shape  
data Ltd

(4411)

## SOUTH GLAMORGAN COUNTY COUNCIL COMPUTER RESOURCES ASSISTANT

(ADMINISTRATIVE SYSTEMS)  
Scale 4/Scale 5 £6,284-£7,896 p.a.

REF A5. Recruited by the South Glamorgan Institute of Higher Education in the Management Information and Resources Section which deals with all administrative computing applications in the Institute. Preference candidates should be competent COBOL programmers with systems analysis skills or those wishing to move into analysis. Holds with staff of all levels. The post offers a challenging and stimulating environment developing and maintaining management information systems on a PDP11-85. A successful applicant will operate mainly from the Cyncoed Centre, Cardiff. Will have significant involvement with all Centres and the Computer Unit at Llandaff, Cardiff.

Requests for application forms (accompanied by a stamped addressed envelope) to the Personnel and Management Services Officer, Floor 8, County Headquarters, Newport Road, Cardiff. CLOSING DATE: 19th JULY, 1983 (please quote job reference).

(4490)

## Anaerobic Digester Research and Development Unit Research Assistant (One year post) Computing

Funded by the Ministry of Agriculture Fisheries and Food  
Salary: £4,580 - £5,908 p.a. inc.

Applications are invited to join a multidisciplinary team working on various aspects of anaerobic digester technology. The post is for a graduate in an appropriate discipline for one year to write a computer program to assess the economics of anaerobic digestion plant. A prior knowledge of anaerobic digestion is not essential but applicants must have experience of writing interactive FORTRAN programs for microcomputers. Experience with databases would be an advantage. The program will be written for the CASU Mini II microcomputer running under CP/M.

Further particulars and application forms are obtainable from:  
The Personnel Officer, The Polytechnic of Wales, PONTYPRIDD, Mid-Glamorgan, South Wales. CF 37 1DL Tel. (0443) 406183 ext. 2021 (Please quote Ref. No. MAFF4)

Closing date: 29th July, 1983.

(4498)

The Polytechnic  
of Wales

## RESEARCH VESSEL SERVICES Computing at Sea

A PROGRAMMER is required to join a team providing software for scientific computer systems on the NERC research ships.

The systems are PDP11-based with RSX 11-M using FORTRAN and MACRO-II. Experience of these or with UNIX and 'C' in a scientific or real time environment would be desirable but not essential.

The post involves spending some time working at sea and travelling to and from ships abroad.

Qualifications/Experience: Normally below age 27 with a degree, HND, HNC or an equivalent qualification in an appropriate subject. A pass in BCS Part II or relevant experience is acceptable.

Salary scales: Appointment will be in the grade of Scientific Officer with salary scale of £5,882-£7,785 p.a. The starting salary may be above the minimum depending on qualifications and experience. In addition, under the present regulations, a Scientific Officer could expect to increase his/her earnings by at least £1,000 p.a. with normal sea-going duty.

The Research Vessel Services operate and maintain several oceanographic research ships and provide a wide range of instrumentation and computing facilities for the marine research programmes of NERC component bodies and university departments.

Further details and application forms may be obtained from:  
Natural Environment Research Council, Research Vessel Services, No. 1 Dock, Barry, South Glamorgan CF6 8UZ. Tel: Barry (0446) 737451.

Closing date for receipt of completed applications: 21 July 1983.

NATURAL ENVIRONMENT RESEARCH COUNCIL

(4499)

## BOX NUMBERS

Box number replies should be addressed to:

Box Number  
c/o Computer Weekly  
Quadrant House, The Quadrant  
Sutton, Surrey SM2 6AE

## Hong Kong Polytechnic

### HEAD

## Department of Computing Studies (Tenable from September 1983)

Candidates should possess good academic qualifications, preferably a higher degree or its equivalent, in computing, substantial administrative and teaching experience in tertiary education including academic planning and development of courses up to degree level, relevant professional experience at senior level.

The department of Computing Studies at present offers Higher Diploma and Diploma courses in computing studies, which are organised on a mixed-mode credit-unit basis enabling students to complete their respective programmes at a pace dictated by their personal needs and circumstances. The department also offers a full-time three-year Higher Diploma course in systems analysis. A new B.A. (Hons.) degree course in computing studies specialising in information systems will be introduced in October 1983. The degree course will be a full-time four-year sandwich course validated by the Council for National Academic Awards in the United Kingdom. The degree award will be conferred by the Polytechnic on successful students in accordance with the Polytechnic's own regulations. In addition, the department provides a substantial amount of service teaching to other departments in the Polytechnic, mainly in the areas of computer application, computer programming and use of application packages.

The successful candidate will be required to direct the department's academic activities and development, to be responsible for its proper management and administration, to promote effective inter-departmental and external relations, and to participate fully in the work of the Polytechnic.

The salary is within a range and not less than HK\$277,200 p.a. (E1 - HK\$1.01 on 27.8.83).

The appointment will be on four-year gratuity-bearing contract terms initially. Thereafter, further contracts or superannuation benefits of service may be offered at the discretion of the Polytechnic. Benefits include vacation leave, passages for appointees on overseas terms of service, subsidised accommodation, medical and dental treatment, children's education allowance, and a terminal gratuity equal to 25% of basic salary received over entire contract period.

Further information and application forms are obtainable from the Association of Commonwealth Universities (Acps), John Foster House, 26 Gordon Square, London WC1H 0PF. Completed application forms should be returned to the same office by 29 July 1983.

(4485)

## SOMERSET COUNTY COUNCIL

### SOMERSET COLLEGE OF ARTS AND TECHNOLOGY

#### TAUNTON

### Department of Engineering

## LECTURER GRADE II IN COMPUTING (TWO POSTS)

These two posts are available from September 1st, 1983, or as soon as possible thereafter and must be filled not later than January 1st, 1984. Essential requirements are a degree or professional qualification, some previous lecturing experience, or teacher training and experience of a range of computers in commerce and/or industry.

Further particulars and application forms, s.a.s. from: The Chief Administrative Officer, Somerset College of Arts and Technology, Wellington Road, Taunton TA1 5AX.

Closing date: July 25th, 1983.

(4472)

## TEESSIDE POLYTECHNIC

### DEPARTMENT OF COMPUTER SCIENCE

## SOFTWARE TECHNICIAN

Ref. PTD.111, grade scale 6, salary £5,184-£6,712 p.a.

## HARDWARE TECHNICIAN

Ref. PTD.112, grade scale 6, plus qualification allowance

## GENERAL TECHNICIAN

Ref. PTD.113, grade scale 4/5, salary £3,264-£7,890 p.a. plus qualification allowance

Applications are invited for the above posts from candidates who have a sound knowledge of Computer Science or Technology at HND or Degree level. The department has a variety of microcomputer and minicomputer equipment housed in five laboratories which support teaching and research activities.

The Software Technician will work closely with academic staff on the larger computing systems including a VAX 750 and an Ethernet local area network. Interest in basic software maintenance and development would be helpful.

The Hardware Technician should be capable of fabricating digital electronic circuit boards and constructing prototyping rigs, particularly for interfaces between computer systems and peripheral equipment. Experience with communications equipment would be an advantage.

The General Technician will carry out routine tasks to maintain and operate the department's equipment and assist the more senior technicians under their supervision.

Further particulars and application forms obtainable from Personnel Section, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland TS1 3BA. Tel: (0645) 218121 ext 4116. Closing date for applications: 21st July, 1983.

(4480)

## DEPARTMENT OF COMPUTER STUDIES & MATHEMATICS

### READER IN COMPUTING

Ref L/60

Applications are invited for a Readership in Computing. Applicants should have a suitable postgraduate qualification and substantial experience in research/consultancy. The successful candidate will be expected to conduct and promote research and its commercial/industrial applications, to attract and organise collaborative projects between the Department and external organisations, and to complement the research area led by our current Reader in Information Systems. The appointment is from 1 September 1983 or as soon as possible thereafter.

SALARY SCALE:  
£12,519-£13,938 (bar) - £16,744 per annum

For further details and an application form, to be returned by 28 July 1983, please contact the Personnel Office, Bristol Polytechnic, Coldharbour Lane, Fenchay, Bristol or telephone Bristol (0272) 656281, Ext. 216 or 217.

Please quote Reference Number L/60 in all communications

(4481)

Bristol  
Polytechnic

bb

## MANAGEMENT INFORMATION SERVICES

S.E. England

c.£13.5K

Our client seeks an individual with sound experience of developing computerised management information systems and who ideally has had some experience of programme management in the defence industry.

Reporting to the Commercial Services Manager, the successful appointee will be responsible for providing a comprehensive Management Information Service to a unit with about 800 employees, which is part of a highly successful, rapidly expanding company. He would create and head up a new section which provides a management information service on all matters relating to the control of several multi-million pound high technology defence projects in conformity with requirements of both the unit and of the company. The section will provide financial, accountancy, contract control and project control information as well as providing facilities for other users within the unit to establish effective management control systems. You would be expected to deputise for the Commercial Services Manager in his absence.

This important new position offers excellent rewards with large company benefits in one of the most active divisions of a leading company, itself part of a highly successful, major international group. The company has an order book which takes it potentially beyond the year 2000, is committed to developing new business areas and is making a major penetration in the world market.

To find out more and to apply in complete confidence, telephone Bernard Innes on Hemel Hempstead (0442) 212855 during office hours or on Hemel Hempstead 211814 evenings or weekends (not an answering machine), or write to him at the address below:

Executive Recruitment Services  
29-33 Bridge Street, Hemel Hempstead, Herts. HP1 1EG  
Tel: (0442) 212655 (5 lines)

## USER LINK

### SENIOR PROGRAMMER IN SOUTH MANCHESTER

Programmer required for a rapidly growing company producing microcomputing systems for communicating with remote computers. The work will include Z80 assembler, Pascal programming and a knowledge of CP/M. The appointee is expected to contribute personally to the vigorous development programme and will share in the management and success of the company. Salary negotiable, depending on experience, attitude and commitment.

USERLINK SYSTEMS, 9 Brabyns  
Brow, Marple, Stockport  
Cheshire. Tel: 061-427 8576.

(4482)

## THE UNIVERSITY OF MANCHESTER

### Department of Astronomy

## MANAGER OF THE STARLINK NODE

Applications invited for the above post to manage the Manchester Node of the Starlink network. Duties will involve the smooth running of the node, to assist users with problems and to contribute in the development of software for the Starlink project. Applicants should have a degree in a numerate subject, at least three years of relevant computing experience. An interest in Astronomy would be an advantage. Post available initially for two years from October 1st, 1983, or as soon as possible thereafter. Salary range p.a.: £7,180-£11,816 (superannuation).

Particulars and application forms returnable by July 17th from the Registrar, The University, Manchester M13 9PL. Quote ref. 118/83/CW.

(4484)

## ICL SYSTEM 10/25 COBOL/ASSEMBLER

### MIDLANDS & SOUTH

Contact: CATHERINE TUCKER  
LORIAN COMPUTER SERVICES LIMITED  
Telephone: LEEDS (0532) 455911



## CITY OF CARLISLE

Applications are invited from men and women for the post of:

## SYSTEMS ANALYST/PROGRAMMER

(POST A120)  
GRADE AP.2/6 - £5,040 - £9,712

for a new appointment in the City Treasurer's Department, which has been approved in conjunction with the adoption of an ambitious Computer Development Plan.

In addition to ICL 1500 and 7500 series equipment linked to the County Council mainframe (2956/2986), the City Council is about to embark upon a major investment in ICL D.R.S. equipment as part of a five-year plan to provide information technology to all major departments of the Council.

Applicants should have at least two years' experience of programming and a knowledge of CIS Cobol and Basic is desirable but training in these languages may be made available to a suitable applicant.

Whilst formal qualifications are not essential, applicants who can show evidence of achievement in a disciplined academic, professional or technical capacity will receive favourable consideration.

Further details and application form, returnable by 22nd July, 1983 from the Personnel and Training Officer and Chief Executive's Department, Civic Centre, Carlisle, CA3 8QG, telephone Carlisle (0228) 23411 ext 283, Quoting Post No A120.

(4518)

# REAL-TIME SOFTWARE DESIGN & DEVELOPMENT

When you try to get a deeper perspective  
on work, does it all become a blur?

On face value C3 offers enormous challenge. Yet do you ever get the feeling that the deeper you look, the more obscure it all becomes? Do you feel a stunning lack of satisfaction? Do you find limits not license on creative freedom? Do you find frustration not fulfillment? A lot of Software Engineers do - they never see the full picture. Never put their contribution into context.

But they do at Scicon. Because we offer total involvement - from first concept to completion. Scicon have the distinction of being one of Britain's leading systems and software companies. A fact which should lead you to two conclusions:

1) No company gets to the top in this ultra-competitive service industry unless they have a very special skill to sell.

Ours is multi-faceted.

We have for example, developed systems for the oil industry, factory automation, message switching, motor racing and, last but not largest of all, the M.O.D.

2) Clearly, there's no shortage of projects or scope at Scicon.

Right across the creative spectrum we need agile minds to develop some of the most complex real-time defence systems in Britain today - projects currently on the drawing boards involve:

- Developing the software for BATES, a major C3 system.
- Applying database technology to defence requirements.

There is, of course much more.

We're offering you the prospect of working in our refreshing free-thinking environment, playing a decisive role in small project teams, providing a technical consultancy service both in-house and directly to clients (through-out Britain and sometimes overseas).

Salaries for these positions range from £10,000-£19,500 and benefits are, quite genuinely, the best in the computer services industry.

Get a perspective on the complete project for a change. Join a company that really is committed to individual training and career development. If you have experience in two or more of the following areas, try stretching your outlook and intellect with Scicon.

- C3 Systems
- CORAL 66
- VAX/VMS
- Database
- Real-Time Systems
- Project Management
- Computer Graphics

If you'd like to talk about your experience and how it could match our requirements phone Bob Lomas on: 01-580 5599 during office hours or on: 01-580 9955 between 5.30pm - 9.00pm. Alternatively write with full details to: Sandle Walpole, Personnel, Scicon Limited, 49 Berners Street, London W1P 4AQ. Interviews can be arranged outside office hours.

# Scicon

(4471)

## Computer Professionals

Management? Salesman? Support Specialist?  
Analyst? Software Engineer?

There are many opportunities NOW throughout the UK WHY LIMIT YOURSELF TO ABOUT 20% OF THE MARKET WHEN UP TO 80% OF JOBS IN THE INDUSTRY ARE NEVER ADVERTISED? OFTEN THE MOST EXCITING AND REWARDING ONES!

One application only will cover ALL the market. You can then sit back and let the opportunities come to you. Professional 'Careers' Help costs you nothing. Part-time job hunting could cost you a career!

HOOK INTO THE GRAPEVINE NOW  
RING 0532 434561

## Freelance on IBM SYSTEM 38

We need 3 to 4 Programmers with RPG III to work in a project development team.

Start times over the next 8 weeks.

Please Ring: Sheila Fox  
Link Associates Limited  
24a High Street, Chesham, Bucks.  
(0494) 784922

link

(4504)



## SENIOR APPOINTMENTS - £14K +

### Computer Services Manager

NORTH LONDON

remuneration circa £20,000,  
executive car and excellent fringe benefits

Our client is a successful major international organisation, enjoying an enviable reputation for the excellence and quality of a wide range of fast moving consumer products, many of which are market leaders in their field. Reporting to the Management Services Director, the appointee will be responsible for all aspects of production services, covering network control, operations, change control, user Help Desk facilities and other ancillary functions. The company's already substantial facilities, comprising an IBM mainframe supporting over 100 terminals, have recently been enhanced and further expansion is currently planned. The successful candidate will thus play an important role in determining the future nature of processing resources.

This is a key management role requiring a combination of high supervisory skills, a solid IBM mainframe background and demonstrable responsibility for all aspects of production services. Experience of operating within a VM/DOS/VSE or MVS environment, with CICS, would be ideal but this is secondary to a total commitment to providing the highest level of user service. Age indicator is around the mid-30's.

Commensurate with the importance of the position, an excellent remuneration package is offered, comprising high starting salary, to £17,500, together with participation in the company's outstanding profit-linked bonus scheme which will substantially increment the basic salary. In addition, the appointee will enjoy the benefit of a fully financed prestige car, non-contributory pension and free life and medical insurance.

To apply, please send a CV or write or telephone for an application form to JOHN KITCHEN, at the address below, quoting Ref. GW1138.

(1445/7)

BIS Applied Systems Limited  
York House, 199 Westminster Bridge Road  
London SE1 7UT  
Telephone 01-633 0866

BIS Applied Systems

Management Opportunity

### MICRO SALES

£25K

Sierra 2 Litre GL

Northern Home Counties

Top manufacturer - outstanding product development and comprehensive software and marketing support.

Build your own team to create new dealership network and expand established user-base. Realistic targets will produce earnings of £30K+.

Ideal profile - mid-late 20s with proven track record of two/three years' on target performance in mini/micro hardware/software sales. Reference 6917.

(4828)

Lloyd Chapman Associates

123, New Bond Street, London WY1H 0HR 01-486 7781

## NETWORK OPERATIONS MANAGEMENT

### CITY OF LONDON

TO £14,500  
+ BANK BENEFITS

Our client a major International Bank with a Telecommunications Centre based in the City of London now wish to recruit a manager for their Network Operations Group. The Bank currently operate an extensive range of telecommunications hardware with plans to introduce further advanced services to the UK and International environment.

The person appointed will be responsible for Network Control and Installation, Scheduling, PABX support, Dealerphone System support and all liaison/administration activities involved with the provision of an efficient and secure telecommunications service. This role will involve staff management of a group of ten installation and operations engineers and you will be expected to project manage new developments, co-ordinating with Equipment Manufacturers and other Senior Technical Management in the Bank, in the UK and Overseas.

Candidates will be required to offer sound Telecommunications experience including both Voice and Data networking, in addition to a related professional qualification.

If you believe you are able to offer the background and experience for this challenging role telephone or write to DP Selection Services quoting reference W7071.

01-434 2042

(24 hour Answerphone)

dp SELECTION SERVICES

A member of the DP Support Services Group

7 Swallow Street, London W1R 7HD

"We look forward to hearing from you."

(1446/4)

## SENIOR APPOINTMENTS - £14K +

COMPUTER WEEKLY July 7 1983

### Computer Facilities

mini management-maxi effect

c.£12,000-£15,000

This key role involves the management of in-house computer systems for one of the UK's leading systems houses - Software Sciences. The company's facilities have expanded in line with its rapid growth and now include PDP 11's, M700's and a VAX network which links our UK offices in Hampshire, Surrey and Cheshire. The person we're seeking will control the utilisation and operation of the systems, as well as planning and implementing further systems in line with expanding company needs.

Success in the job will depend on being able to meet the demands of the many users within the company - sales and marketing, software developers, and business managers. Planning and scheduling to meet such demands will require some of the skills of a tightrope walker - occasionally the ability to say "no". In addition to a strong personality, you will need an extensive background in multi-user computer operations incorporating teleprocessing

facilities. Experience of equipment selection and familiarity with a variety of hardware, including DEC, are also important.

Salary will be negotiable in the range of £12,000-£15,000 and the benefits package includes pension, life assurance and free family BUPA schemes. Relocation assistance to the Surrey/Hampshire base will be available if appropriate.

In the first instance please telephone 0252 544321 for an application form, or write to: Sharon McKeever, Software Sciences Limited, Abbey House, 282/292 Farnborough Road, Farnborough, Hampshire GU14 7NB.

SOFTWARE SCIENCES LIMITED

(4822)

## Sales Executives

A Growing Company... Backed by one of the UK's Largest Groups

Our Client is a wholly owned subsidiary of one of the UK's largest and most successful organisations, with a turnover in excess of £2,500 million generated by over 250 diverse world-wide companies.

This one year old Information Technology Division is responsible for computing and communications within the parent Group and, as such, has gained experience of many manufacturers systems including ICL, IBM, DEC, Data General, Computer Automation, Olivetti and Tandem.

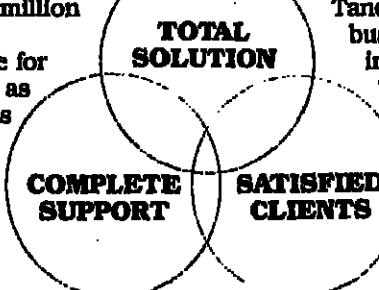
In October 1982 they began to market this expertise to external users and have already established sales and support bases in London and the North.

Now an ICL trader point they are regularly announcing

additional hardware and software products - such as Epson and Tandem distributorships - with a view to developing a range of business solutions that cannot be matched elsewhere within the industry.

They possess the financial resources to validate their dramatic growth plans which include the opening of further branches throughout the country.

We now wish to recruit skilled and ambitious Sales Executives who recognise that the positions described below represent genuine opportunities for rapid personal development. In fact, with our Client, your prospects couldn't be brighter.



London (City) Based

Basic c. £12,000 + High Commission + Car

As a young, successful, system sales professional, ideally possessing experience with a computer manufacturer, you should be attracted by this developing organisation and its substantial financial and technical resources. For the first time, you will have access to a proven, comprehensive range of business solutions with which to establish new market places.

Based at the Company's new headquarters in the City of London you will be provided with a realistic quota, a large territory that will include significant reference sites and the opportunity for a high degree of self-management.

There are several positions available, some of which are biased towards establishing and developing a key accounts customer base. Each Sales Executive will be provided with comprehensive marketing and technical support of the highest quality.

Your success will be rewarded; as our Client continues to expand their operations throughout the UK, consequently the ambitious individual can look forward to fast career development and a consistently high level of earnings.

For immediate consideration and for further detailed information on the Company's products, Organisation and current requirements please contact Ian Goldamid on 01-935 0671 during office hours, alternatively send your confidential career resume to the London address below.

Technical, Sales & Management Appointments

Specialist Computer Recruitment Ltd

<b>SOUTH</b> James House, 46 James Street, London W1M 5HS 01-935 0671/486 0461	<b>MIDLANDS &amp; INTERNATIONAL</b> 35-37 Great Charles Street, Queensway, Birmingham B3 3JY 021-236 3761	<b>NORTH</b> International House, 84 Deansgate, Manchester M3 2ER 061-833 0427	<b>BELGIUM</b> Avenue Louise 327 Boite 4 1050 Bruxelles 010 322-640 7151/71	<b>HOLLAND</b> Waterslootweg 14 1071 H M Amsterdam 010 3120-76947
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# Computer Development Manager-Retailing

## East Midlands c£16,000

A diversified, long established but progressive retailing operation - annual turnover £120m plus - seeks to recruit a Computer Development Manager, reporting to the Financial Controller. The job purpose is to develop and implement a strategy for the provision of computing services to the trading divisions and service departments.

The present systems are provided by a combination of bureau services and in-house systems. Key tasks include: the reviewing and co-ordination of existing services; determining how user requirements can best be met; provision of support to operating divisions in installing in-house equipment; the management of specific projects.

Ideally, candidates should be able to demonstrate a background of successful achievement in the retail or distribution industries, either in application software development or business systems consultancy,

preferably with some project management experience. Knowledge of POS and scanning systems would be an advantage, as the company is currently mid-way through a major scanning trial in one of its superstores. It is anticipated that in due course the job holder will develop his or her own department, and therefore experience of line management would be a recommendation.

This is an exciting opportunity to become a successful member of a go ahead team who are now keen to exploit the technological advances in computing to achieve the company's business objectives.

Benefits include staff discount of up to 20% on non-food purchases plus the payment of relocation expenses if required.

In the first instance contact Ralph Ackery on 01-631 4184 or write to him at:

A&A Consultants (Holding) Ltd., County House,  
10 Little Portland Street, London W1N 5DF.



## LAING & CRUICKSHANK

### COBOL PROGRAMMERS

IBM ENVIRONMENT — TRAINING PROVIDED

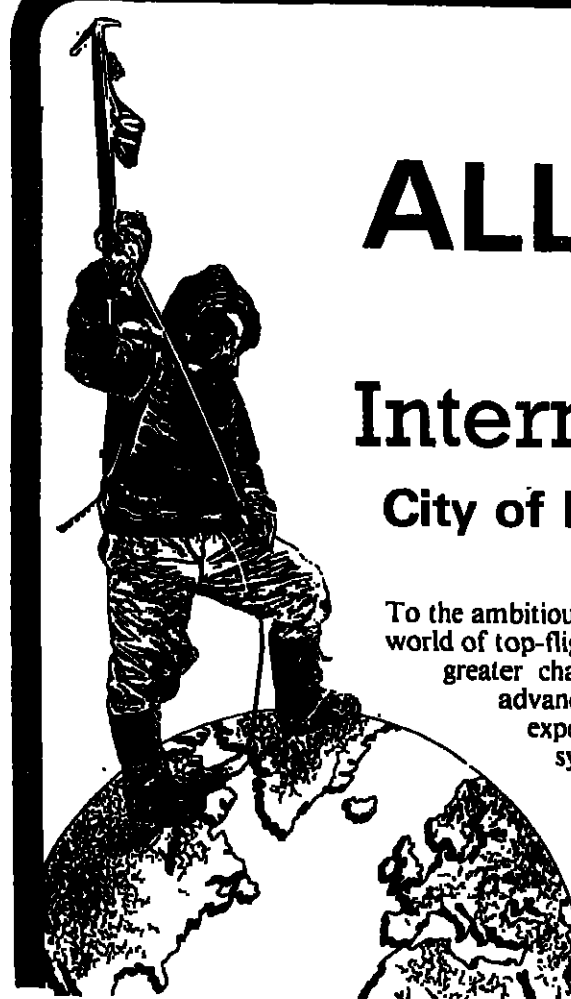
- The Positions :** Senior Programmer · Programmers.
- The Company :** Laing & Cruickshank is one of the most prestigious stockbroking firms in the City of London. We are currently seeking to expand our programming team which is based at our d.p. centre on the North East borders of London.
- The Equipment :** IBM 4300 running under VM/DOS with CICS, Cobol and RPG II programming languages.
- The Requirement :** Ideally you should have an IBM/CICS/Cobol background, but we are open minded in our approach to recruitment and would be happy to offer training to candidates with good online Cobol programming experience.
- The Career :** We can offer you an excellent career path with advancement to an analysis role within two years of joining. We are committed to several major developments and we are introducing advanced technology in the area of office automation.
- The Rewards :** We are looking for people with potential and we will offer competitive salaries to attract them. Regular reviews ensure that we remain competitive with other employers. In addition we offer considerable benefits including a non-contributory pension, a 32½ hour working week and season ticket loans.

Interested? ... then please contact either Chris Morrow or Geoff Bell of Total Selection who have been retained to advise on this appointment.



388 CITY ROAD, LONDON EC1V 2QA  
Telephone 01 837 0451

145/235



## Young Programmers — take your career ALL THE WAY TO THE TOP in International Management Consultancy

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To the ambitious and talented young programmer, the demanding world of top-flight management consultancy has much to offer — greater challenge, varied project involvement, rapid career advancement and the opportunity to gain first-hand experience of the latest developments in computer systems.

One of the world's leading management consultancies, with a strength of 275 professionals in the U.K. and over 2000 worldwide, our client enjoys an excellent reputation for providing d.p. consulting services to clients in many countries. With demand for their services increasing, they now wish to appoint several young computer professionals of exceptional potential.

To discuss these opportunities further, contact Barry Latchford on the number below up to 7.00 p.m. or on Newick (082572) 3197 evenings and weekends, or send a brief career history quoting Ref. CG684.

### JUNIOR CONSULTANTS c.£9000

You will be involved in all aspects of the design and development of advanced systems on a variety of hardware — activities will range from designing interactive microcomputer systems to implementing major on-line/database systems on large mainframes, liaising closely with the company's clients.

In your early- to mid-twenties, with a degree or equivalent, you will have gained between 18mths. and 3 years' sound programming experience in a disciplined commercial environment — solid experience of COBOL and/or RPG11/111 would be of immediate interest. You will have gained exposure to program design and specification, be highly self-motivated and possess excellent communicative skills.

An exciting future is assured — you will be expected to progress rapidly into senior positions, gaining experience in the many facets of the consulting business, with opportunities to travel internationally and to move into wider consulting roles in the future.

**Barry Latchford Associates**

Blair House, 7 Hazelgrove Road, Haywards Heath, West Sussex RH16 3PH

Tel. (0444) 459815/6

## RECRUITMENT OPPORTUNITIES

**HEWLETT PACKARD SNR. PROGRAMMER**  
LONDON UP TO £11,000  
A Financial organisation requires an experienced Cobol programmer with some knowledge of HP 3000 systems. Good benefits. REF. J7411.

**SENIOR SYSTEMS ANALYST**  
NORTH LONDON £ NEG.  
A minimum of four years' systems design in an on-line Commercial environment plus Cobol experience are required for this Senior position. REF. J7474.

**PRIME ANALYST/PROGRAMMER**  
LONDON UP TO £12,500  
This company are looking for applicants with at least one year's experience of INFO, to work on Technical applications. REF. J7442.

**DEC PROGRAMMERS**  
SURREY £ NEG.  
Two years' commercial programming experience using RSTS or VMS, and Basic, are required to fill vacancies with this expanding company. Plenty of user contact. REF. J6717.

**PROGRAMMERS**  
SOUTH EAST £8,500-15,000  
Several positions exist for Fortran programmers with a min. of two years' exp. of Seismic/Geophysical applications. REF. J7465.

**BURROUGHS SNR. PROGRAMMER**  
LONDON UP TO £12,500  
Five years' Medium Systems experience plus good knowledge of Burroughs CMS, B90 systems for Banking organisation in the City. REF. G.7468.

**ICL SYSTEMS ANALYST**  
SURREY TO £11,500  
Exp. analyst of at least four years, two of which as analyst with experience of Parsons to work on new development. REF. G.7281.

**ICL DP MANAGER**  
SURREY £16,000 + CD. CAR  
High calibre individual with proven ability to take a leading role with Manufacturing company. Extensive ICL 2800 experience and management capabilities. REF. G.7195.

**UNIVAC SYSTEMS PROGRAMMER**  
LONDON £10,500  
Extensive UNIVAC 1100 series software knowledge. Assembler essential, communications and network experience advantageous. Some international travel is involved. REF. G.7420.

**TANDEM PROGRAMMERS**  
LONDON £10,000  
Financial organisation in the City seek Tandem COBOL programmers with good application of Tandem software to work on new development. REF. G.7112.

**SENIOR PROGRAMMERS AND PROGRAMMERS**  
CITY £ NEG.  
International Bank requires personnel with Cobol, to work on new development projects. Ideally with CICS and DL1 but will look at applicants with either. Banking experience not essential. REF. R.7485.

**SENIOR SYSTEMS ANALYSTS**  
LONDON UP TO £14,000  
Well-known company are looking for business and technical analysts with Cobol, CICS and DL1 experience. REF. R.7445.

**ANALYST/PROGRAMMERS**  
CITY UP TO £13,000  
Minimum of two years' RPG II and international banking essential. Position offers travel and an opportunity to be trained on CICS/DL1 system. REF. R.7484.

**SYSTEMS ANALYST**  
SURREY UP TO £13,000  
Manufacturing company require someone with four years plus experience, to work on online systems and other new developments. Knowledge of Cobol running under MVS desirable. REF. R.7476.

**ANALYST/PROGRAMMER**  
WEST LONDON £11,000  
PL1/Cobol experience, min. two years. To work on new projects for book publishers. Candidates willing to move into analysis will be considered, together with training on CICS. REF. R.7297.

**SENIOR ANALYST AND PROGRAMMER**  
CITY £ NEG.  
International company require persons with a sound knowledge of RPG II to develop their System 34. Good all round commercial experience is desirable. REF. R.7487.

## CONTRACTS

**SYSTEMS PROGRAMMERS**  
We require systems staff with extensive Assembler experience on Minis. Of particular interest are those who have worked with T8000 or INTEL 8086. We also require an REXX 11M systems person with Assembler and Fortran.

**COBOL IMS DB/DC**  
We have several requirements for both analyst/programmers and also team or project leaders with the above skills.

**SYSTEM 38 PROGRAMMER/ANALYSTS**  
A number of requirements exist including a long term banking project in the City.

**SYSTEM 34 RPG II ANALYST/PROGRAMMERS**  
Our client requires three analyst/programmers with experience of MAAPICS. You must be prepared to travel in Europe.

**IBASIC/CIS COBOL**  
We have three clients who have requirements for analyst/programmers with experience with both or either of these languages.

**MVS SYSTEMS PROGRAMMER**  
To advise on VM/SP to MVS/TSO conversion.

**BUSINESS ANALYSTS**  
To advise on hardware purchase and systems set up for an office mechanisation project.

**COBOL/PRIME/PRIMOS ANALYST/PROGRAMMER**  
To assist our client in the design and implementation of a system for the motor industry.

**ADABAS**  
Analyst/programmer to participate in a conversion exercise. Extensive experience of COBOL and ADABAS is essential.

**COBOL CICS DL/1**  
We have a number of vacancies in and around London for people at all levels with the above skills.

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## FREELANCE OPPORTUNITIES

### SOUTHERN 0252 516141

ADF Programmers  
BURROUGHS 8800/8700 COBOL Analyst/Progs.  
CDC BASIS or NASTRAN Progs.  
DATAPOINT Database Databus Prog./Analyst  
DG Eclipse COBOL INFOS  
Hardware/Software Engineers  
Honeywell GCOS, TDS

Ref.  
DL 101  
DL 102  
SB 103  
SC 104  
CW 106  
SC 109  
DB 110

#### URGENT

IBM System 38 RPG III Consultant  
Program, design & team leading duties  
Preferably manufacturing exp.  
9 months + Assignments. Ref: SB111

IBM DATABASE Administrator with IMS DB/DC  
IBM System Programmer  
IBM 8100 DPCX or DPPX  
IBM PL1, IMS DB/DC  
IBM PL1 CICS & DL1  
IBM PL1, Adebas  
IBM COBOL DL1  
IBM COBOL IMS DB/DC  
IBM COBOL CICS DL1, some with JSP  
IBM NOMAD  
IBM Series 1 expertise  
IBM System 38 RPG III  
ICL DRS 20 and CICS COBOL Progs.  
ICL IMS Systems Prog./Designer  
ICL CORAL with COBOL  
ICL ME29 TME range COBOL  
ICL System 28 Designer and Progs.  
ICL VMEB IDMS, all levels, some with TPMS  
ICL 2900 VME Technical Support, all levels  
ICL VMEB COBOL with SCL  
INTEL 8086 Programmers  
Micro Basic or Assembler - URGENT  
Michael Jackson structured programming  
techniques with COBOL  
Quality Assurance Analysts  
UNIVAC 1100 FORTRAN  
VAX VMS BASIC or COBOL or FORTRAN  
VAX VMS CORAL 86 with INTEL 8086  
VAX VMS SYSTEL expertise

SC 113  
CW 114  
SB 115  
SC 116  
DL 117  
DL 118  
PH 119  
DL 120  
PH 121  
SB 122  
DB 126  
DB 127  
CW 129  
CW 130  
CW 131  
CW 132  
CW 133  
CW 134  
CW 135  
CW 136  
DL 137  
CW 138

SW 139  
CW 140  
SC 142  
SC 143  
PH 144  
DB 145

Contact: STEVE CASEY, PETER HOLLIDAY  
CHRIS WHETTERLY, DAVE LONKHURST  
STUART BLAKE, DAVID BROWN, SANDRA CAREY  
or EILEEN CARMICHAEL

CORAL 86, all levels  
CPG An/Programmer  
DG RDS Assembler  
IBM Systems Programmers  
IBM PL1 IMS DB/DC, some with JSP  
ICL Plan  
MILITARY Real-time Designers

SB 150  
SC 151  
CW 146  
CW 144  
DB 116  
CW 147  
PH 149

### MIDLANDS & NORTH 021-742 4431

BURROUGHS DMS2 COBOL 74 An/Progs.  
DATAPOINT, DATABUS RMS Progs.  
HP3000 Image, Query, View Analysts & Progs.  
IBM 8100 DPPX An/Progs - URGENT  
IBM COBOL CICS DL1 An/Progs.  
ICL VMEB IDMS TPMS Progs.  
ICL ME29 TME TP COBOL An/Progs.  
ICL ME29 TME Analysts & Progs.  
PDP RSX CORAL Progs.  
PDP RSX RTL 2 Progs.  
UNIVAC OS 3 RPG II Progs.  
UNIVAC 1100 DMS TIP An/Progs.  
IBM OS MVS Ops.  
ICL ME29 Ops.  
CMC Reality Anal./Programmers-URGENT

#### PERMANENT

IBM COBOL/PL1 CICS Progs.  
IBM Database Technician  
IBM Series 1 EDX/EDL Progs.  
IBM MVS Ops Analyst  
ICL Analyst/Project Leader

Ref N28  
Ref D18  
Ref D19  
Ref N29  
Ref D20

Contact NEIL SMITH, DAVE PARKER or  
KAREN LONGCROFT

#### URGENT

MICRO 8502 ASSEMBLER

Ref. CW 148

### OVERSEAS 0252 516141

#### IRAQ

Contact: BILL EVANS  
12 months + Assignments July

TEAM LEADERS and ANALYST/PROGRAMMERS -  
Honeywell Level 6 GCOS MOD 400 and  
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training and administration with Honeywell/Olivetti OS,  
DB, TP Comms and H/W

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\* Free Accommodation  
\* Overtime  
\* Pref. single but married status considered

#### SAUDI ARABIA

Contact: BILL EVANS  
12 months + Assignments July/August

ANALYST/PROGRAMMERS with PL1, IMS, ADF,  
TSO/SPF  
\* Up to £25,000 p.a.  
\* Free Flights  
\* Free Accommodation  
\* Paid Holidays



#### HOLLAND

Contact: BILL TORBITT or BILL EVANS  
6 months + Assignments starting July/August  
IBM OS VS1 with IDMS Dutch speaking Progs. &  
Analysts  
VAX VMS Assembler - Systems Programmer  
IBM Systems Programmer with either VM, DOS/VSE,  
CICS or OS MVS

#### USA

Contact: STEVE WHITING  
Urgent requirements for Programmers in Chicago,  
Philadelphia, Baltimore, Boston, etc.  
Expertise required.

IBM COBOL with IMS or DL1  
IBM COBOL CICS/DL1  
UNIVAC 1100 COBOL Analyst/Programmers  
UNIVAC 1100 Systems Programmers  
UNIVAC 1100 Team Leaders

### OPERATIONS 0252 516141

BURROUGHS Large System Workflow Writer  
DATA 100 Operators  
ICL GIII Operators with VMEB, Immediate start, long term  
IBM System 3 Ops. for London, long term  
Honeywell L64 or DPS 7 GCOS  
IBM OS/MVS JCL Writers with CICS

Contact ALAN PAINE, MARK ATKINSON or LYN ADAMS

### PERMANENT 0252 516141

URGENT SALES OPPORTUNITIES  
Contact: FRED BRAMLEY

Accounts Manager - Mini Computers £30k Ref: F85  
Mini-Micro Sales Executives, target earnings £25k Ref: F82

Financial Systems Sales Executives, target earnings £25k Ref: F81  
Programmers with ICL COBOL and pref. SCL, Hants c. £9.5k Ref: J117

Chief Programmer and Progs. with IBM COBOL CICS DL1, Surrey to £13k + excellent benefits. Ref: J116

Systems Co-ordinator/Business Analyst, IBM Series 1, EDX, to £12k+ West London Ref: J187

APL Analyst/Prog. c. £10k, City Ref: J151

IBM Sys 34 RPG II An/Prog. c. £10k, City Ref: J159

Programmers with Micro Soft COBOL, interactive exp., to £11k, Hants Ref: J181

Contact: PETER JEZEPH for an immediate confidential interview or write, enclosing a detailed c.v.

## REUTERS

# VAX, VMS, AND INTEL SOFTWARE DEVELOPMENT

Opportunities of rare scope and challenge now exist within one of the most profitable and fast growing companies in the UK.

As part of our programme to remain the world's leading news organisation and supplier of electronic information services to the media and financial community we are expanding our technical development group in London.

We have one of the largest private communications networks in the world which we are now in the process of replacing. Satellites, LANs, microwaves and advanced networking all play major roles in our approach to developing our new worldwide communications facilities and databases.

Reuters' technical staff not only deal with current but also future technologies and constant attention to development is a key ingredient in Reuters' success. We are one of the largest OEM customers of DEC in the world and at the forefront of the application of

£10,500-£13,000 +

Intel hardware to new terminals and systems under development.

Our requirement is for programming staff to join small highly skilled project teams and contribute to the design and development of Intel and DEC based real time systems to challenging timescales, using excellent development facilities.

Candidates will have had one or more years experience of programming in high level real time languages such as PLM/86 or PASCAL under the RMX/86 or VMS operating systems. Experience with multiprocessor MULTIBUS systems, MMX, Communications protocols, LANs, DECNET or database systems would be an advantage.

For a confidential discussion regarding these opportunities please telephone Miles Richards on 01-938 1804 (24 hrs) or 01-847 2385 evenings 7 pm - 9 pm.

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## Carreras Rothmans Computer Systems Engineers c.£12,000+car

Carreras Rothmans is the UK's largest exporter of cigarettes and a member of the Rothmans International Group of Companies.

We now have opportunities for four Computer Systems Engineers. You will be based initially for 12 to 18 months at our Training, Engineering and Process Design facility in Bletchley, Milton Keynes in preparation for permanent transfer to one of our 4 main production units in Spennymoor, Darlington, Northern Ireland or Basildon.

Whilst at Bletchley the successful applicants will report to a senior member of the Process Design Group with support from other specialists. During this period you will participate in the design and development of highly innovative process control and information systems covering all aspects of tobacco and cigarette manufacture. On transfer to the manufacturing unit you will be responsible for the satisfactory performance and further development of these and other existing systems.

The successful applicants will possess a Degree/HND in Science related subjects and will be able to demonstrate the ability to support a Real Time mini/micro computer based control and/or monitoring system within a process or allied industry. Knowledge of assembler level programming, electronic instrumentation and computer logic circuitry will be required.

Benefits include car, BUPA membership, Life Assurance and generous relocation where appropriate.

Please telephone or write for an application form to: Melinda Walters, Personnel Officer, Carreras Rothmans Ltd., 10 Denbigh Hall Estate, Bletchley, Milton Keynes, Bucks. Tel: Milton Keynes (0908) 641641.

## UNITED KINGDOM ATOMIC ENERGY AUTHORITY

# Experienced Computer Programmer/Analyst

Section Leader, Non-Scientific Applications  
Computer Branch, AEE, Winfrith

The Atomic Energy Establishment at Winfrith is a major research and development laboratory of the UKAEA with considerable experience in the usage and development of complex computer codes for its scientific and engineering programme.

We are looking for an experienced Programmer/Analyst to lead a small team involved in the use of a dual ICL2976 mainframe computer and supporting minicomputers to maintain and develop systems which could include:

- information retrieval
- resources management
- plant maintenance procedures
- accountancy procedures
- stores data processing

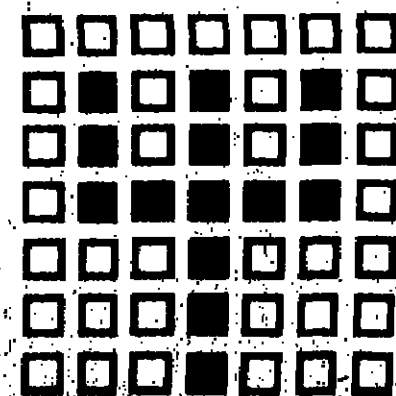
The postholder will be responsible in all the above areas for analysing users' requirements and providing advice and guidance for assisting in the formulation of computer services policy, and for training programming staff.

Applicants should have several years direct experience of applying computer systems to commercial and technical work and have a good background knowledge of ICL COBOL.

Starting pay will be in the range of £8,740 - £11,470 depending on age and experience. The Authority can offer an attractive package of benefits including an excellent contributory pension scheme.

For an application form, please write to:  
United Kingdom Atomic Energy Authority, Personnel Branch, Appointments Section 'B', Winfrith, Dorchester, Dorset DT2 8DH, or telephone Dorchester (0305) 83111 Ext. 2370, quoting reference WB 361  
Closing date: 25 July 1983.

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# COMPUTER SERVICES PLC

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## IBM OPPORTUNITIES

### ANALYST/PROGRAMMER To £10,000

**WEST LONDON.** Retail company in West London have recently purchased an IBM 4331, and are offering 1 to 3 ADAMS and NATURAL. They require 2 years + IBM COBOL, with some experience of CICS, and you will be working on pure CICS development for the next couple of years, with some time split between programming and analysis. Good discount on clothes, 4 weeks holidays and BUPA Scheme. REF C/2383

### IBM ANALYST/PROGRAMMERS To £12,000

**CITY.** This highly respected financial company located in the heart of the City, have requirements for experienced IBM COBOL Analyst/Programmers to work on an IBM 141 mainframe with DOS/VSE, VSAM and CICS experience. With the wide range of development projects that are currently under way, and planned for the future they can offer excellent scope for career progression, with a unique opportunity to be involved with advanced systems. You will be well rewarded in terms of salary which will include a productivity bonus. REF C/2387

### SYSTEMS ANALYST c£12,500

For this position for Analysts with these and new IBM users. They are looking for 3-4 years sound commercial analysis, gained in an IBM environment, with the ability to take systems from design to implementation, liaise with users, get involved in CICS design work, and use your initiative and common sense to the full. REF C/2388

### IBM COBOL £8,000

**ESSEX.** Stimulating and highly rewarding opportunity existing for a junior programmer who can offer 6 months + IBM COBOL experience either in a DOS or VSAM environment. Knowledge of CICS would be a distinct advantage but training in on-line and database techniques will be provided. You will be working within a small and closely knit department, where promotion is based on personal merit. This position offers real advancement for a young programmer who wants more career progression. REF C/2389

### SENIOR PROGRAMMER IBM £10,000-£11,000

**HERTS.** Major manufacturing organisation in Hertfordshire are now in a position to recruit a senior programmer, to work in financial applications. The ideal candidate will have 5 years COBOL programming experience, and preferably CICS and VSAM. Supervisory experience would be a great advantage. This would be a good career move for someone who would like to become increasingly involved in management. Excellent benefits including staff restaurant, sport and social club, and staff discounts. REF C/2387

### ANALYST/PROGRAMMERS To £13,500

**HANTS.** Three positions with established finance company, housing an IBM 141, with VMS, CICS and DLI. They are seeking 3 levels of people from 12 months + experience up to 5 1/2 years, and you should be able to offer IBM COBOL, preferably with some CICS or DLI, and the ability to expand your analysis skills. The senior analyst/programmer will be expected to take a project leading role occasionally and liaise extensively with users. Plenty of development work, and excellent benefits including full relocation, profit sharing, cheap housing etc. REF C/2382

### IBM ANALYST/PROGRAMMER £NEC

**MIDDLESEX.** Successful IBM 4341, VM/CMS, DOS/VSE site are currently seeking an Analyst/Programmer with 2-4 years IBM PL/I experience to assist in the development of a wide range of systems including order-entry, production-control, invoicing etc. To enable you to participate fully in these new development plans, you will receive full training in CICS, and plenty of in-house education to enable you to expand your technical skills. Excellent career prospects and a full company benefits package including travel allowance, pension scheme and a subsidised canteen. REF D/2602

### RPG II/III

### IBM SYSTEM 38 To £12,000

**MIDDLESEX.** Super position with a rapidly expanding finance and insurance company situated in

their own new office block in North Middlesex. Your RPG III skills will be invaluable, in either a technical or applications role, and you will be well rewarded financially for your efforts. They would like to hear from programmer or analyst/programmers with 18 months-5 years experience of CSD and at least 6 months RPG II/III. REF C/2382

### PROGRAMMER/ANALYST £10,000

**CITY.** Two years + IBM System 34/RPG II required for this interesting City position. You will be an integral part of a small team developing and supporting commodity trading and currency systems, and will hopefully progress into a business consultancy role within the firm. Excellent benefits including 2 salary reviews, BUPA, and Lunch Allowance. REF C/2377

### IBM SYSTEM 38 £9,000-£14,000

**CENTRAL LONDON.** First class opportunities exist for IBM System 38 programmers and analyst/programmers. This major software house provide project management and software support to small business system users, with clients based in Central London and the Home Counties. If you are looking for unlimited career prospects and enjoy working in a fast moving environment, then why not call me to discuss these positions in more detail. REF C/2484

### IBM SYSTEM 34 £12,000

**CITY.** Reputable firm of management consultants are looking for an RPG II Analyst/Programmer. The ideal candidate will have financial systems experience within the GSD field and at least 2 years RPG II. You will be developing major systems from design to implementation. This is a rapidly expanding company who can offer an excellent career path to self-motivated individuals. REF C/2389

### RPG III To £11,500

**CITY.** Financial company in the City of London, have recently upgraded to an IBM System 38, and seek a competent and ambitious programmer/analyst with 3 years + DP experience. You must be able to offer at least 6 months RPG II/III system 34 knowledge, and be involved in developing a range of financial/investment systems. As part of a vital team, you will hold a great deal of responsibility. REF C/2378

### ANALYST/PROGRAMMERS c£11,000

**HERTS.** A major multi-national organisation wish to continue their expansion drive by the addition of a further analyst/programmer. You will be part of a small team, responsible for IBM System 34 development. This is an ideal opportunity to improve your analytical skills and progress in your career. The company offer BUPA pension scheme, 4 weeks holidays and guaranteed bonus.

## OTHERS

### DEC BASIC/FORTRAN £NEC

If you can offer in excess of 12 months DEC PDP or VAX experience under any operating system and using either BASIC + (2) or FORTRAN my clients would like to meet you. Ambitious individuals will be able to progress quickly in this fast-expanding organisation. Applications range from finance to administration. You will have a great deal of user contact and will enjoy an excellent salary and package. REF A/1010

### PROGRAMMER PLUS To £11,000

**ESSEX.** Fed up commuting? Do you have 1-5 years ICL COBOL expertise? You could be joining this expanding professional computer services company based in Essex. They seek ambitious individuals with the desire to increase their DP knowledge whilst developing a sound and worthwhile career, in a senior programmer capacity. Applications are mainly financial and they offer the chance to train on new machines, and to develop into analysis. An excellent salary and package is offered including flexi-time. REF D/2428

### RETRAIN -- ANY COBOL c£10,000

This major commercial organisation based on the London/Herts/Middlesex borders are expanding their U.K. division and seek programmers and seniors with a thorough knowledge of COBOL on any mainframe. They offer extensive training in UNIVAC 1100, database and relevant software. The systems are varied and range from financial to commercial. Career prospects are good and this is an excellent opportunity to develop your skills on an alternative machine. REF A/1782

### HEWLETT PACKARD -- COBOL c£9,000

Based in Surrey, this manufacturing concern seek a Junior Programmer/Analyst with a minimum of 6 months HP3000 COBOL experience, preferably having used IMAGE, VIEW and QUERY. You will be developing on-line order processing, personnel, and accounting systems. Prospects for promotion are excellent and promotion will come rapidly to the right applicant. Please now for more details. REF A/2384

### ICL COBOL To £9,000 + Mortgage

**SURREY.** Highly successful ICL 2900 site currently in the process of developing new systems are offering interesting work to experienced and enthusiastic DP professionals. In order to achieve this development, they are seeking ICL COBOL/VME programmers. 18 months + experience is required, and exposure to TPMS and DMS would be desirable, although full training can be provided. In addition to a competitive salary, they provide a well defined career path, pension and life assurance schemes, plus a mortgage subsidy. A relocation package may be offered where appropriate. REF D/2458

### HONEYWELL -- COBOL £10,500

Excellent opportunity for Honeywell mainframe programmer/analyst to further their knowledge whilst developing an exciting and sound career. If you have 18 months + Honeywell L6664 COBOL experience, hopefully having utilised DMS and TDS then I would like to hear from you. My client, a major Essex based concern is expanding its development team. There is plenty of scope for advancement. An excellent package and salary is offered. REF A/1712

### ICL ME29 To £10,500

**CITY.** This is an excellent opportunity for a programmer to take up a key position within this well established insurance company. The company house 2x ICL ME29 running under TMS. Applicants should have up to 18 months ICL COBOL experience, preferably utilising TMS. You will play an integral part in user training, coding, design and implementation of a range of insurance and business systems. This is a new position offering career prospects, in-house education, exciting development projects, and a pleasant and flexible working environment. Excellent package including subsidised lunches and 4 weeks holidays. REF D/2452

### BURROUGHS -- SENIOR c£13,000

This expanding professional organisation, based on the Middlesex/Surrey borders is seeking Senior analyst/programmers and analysts to become part of a team completing development work to an extremely high standard. You must have a minimum of 3 years relevant Burroughs mainframe experience coupled with the ambition to progress. Training is offered at all levels as is the opportunity to work on a variety of applications including: accounting, manufacturing and banking. An excellent package is offered. REF A/1913

### DEC -- BASIC/COBOL To £12,000

My clients based in the heart of the City are currently seeking an Analyst/Programmer with 2 years + DEC/PDP or VAX experience and one or more of the following: REPL/UTS/VMS and either COBOL and/or BASIC. They offer the chance for you to become an integral part of a team developing varied and interesting financial and insurance systems to a very high standard. Promotion prospects are excellent. The company offer a salary that will more than commensurate with experience and standard large company benefits. REF D/2566

### COBOL -- RETRAIN To £10,500

**MIDDLESEX.** Super opportunity for an ICL COBOL programmer to retrain on the latest and most advanced Honeywell equipment, and increase their on-line and analysis skills. A minimum of 12 months relevant experience is required with one or more of the following: 1900 COBOL, FILETAB, GEORGE II, DMB or MTS. An excellent career path is envisaged. Call now for further details about this exciting position. REF D/2378

### DEC -- RETRAIN TO IBM! £NEC

Exciting opportunity for a DEC/PDP BASIC + 2 programmer to begin retraining almost immediately on a new IBM 4331 using CICS. You will be required to complete some maintenance on the DEC, while developing projects on the IBM. Applications include Order Processing, Management Information, and Ledgers. London-based, my clients offer a good career path, excellent salary and extensive training. REF A/2369

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on

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HEWLETT-PACKARD  
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**Programmers, Analyst/Programmers and  
Systems Analysts are urgently required**

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### DEVON AND CORNWALL CONSTABULARY

Applications are invited for the following post within the Computer Department of the Devon and Cornwall Constabulary based at Police Headquarters, Exeter.

## SYSTEMS ANALYST

GRADE 802 -- £9,945 to £10,839

This post provides an opportunity for a competent computer professional to work in an exciting and developing technical environment. The Force is engaged on implementing distributed computer systems, data base facilities and an internal packet switch network. It also runs extensive existing D.P. facilities. The successful applicant will be expected to work on any of these projects. Knowledge of real time systems and database applications will be an advantage. At least three years' experience in high level language(s) is required.

For application form and further information please apply to the Chief Constable, Devon and Cornwall Constabulary, Civil Staff Establishment Office, Police Headquarters, Middlemoor, Exeter EX2 7HQ.

Closing date for completed application forms: 22nd July, 1983. (4510)

### SOUTH WEST UNIVERSITIES REGIONAL COMPUTER CENTRE

## UNIVERSITY OF BATH ADVANCED NETWORKING AND SYSTEMS

SWURCC provides computing services to six universities in the South West via one of the first X.25-based open networks, involving ICL, GEC, Honeywell, DEC and Prime equipment and BT's Packet Switching System. The centre is equipped with a dual ICL 2900, DEC 4000 machines, PERQ and UNIC-based micro equipment. Present developments include a joint project with ICL to develop networking software for VME for the UK academic community.

Applications are invited from recent graduates or potential team leaders to work on this and possibly other projects. Experience of wide or local area networking or operating systems such as UNIX, VME or OS 4000 is desirable especially for the senior post. The appointment is for three years initially on the scale £11,100 + £4.1% or £6,310 + £11.81%.

Further particulars and application forms from the Personnel Officer, University of Bath, Bath BA2 7AY. Ref. 83/75. Closing date: 28th July, 1983. (4482)

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- ☐ MICROPROCESSORS
- ☐ UNIX
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## Technical Product Support Consultant c. £15,000

A sound DEC based technical knowledge, preferably including VAX, VMS, FORTRAN, together with VIDEOTEX/INFORMATION TECHNOLOGY experience. Absolutely essential are the interpersonal skills to support our clients and install our products, together with a 'customer friendly' approach to life with the product and its maintenance. If you feel you have the ability to truly negotiate

## Software Engineers and Programmers c. £14,000

Experienced VAX, VMS, MACRO, RSX11M, FORTRAN, REALTIME people are urgently needed to work on a variety of projects including VIDEOTEX and NETWORKS. We require competent, self-motivated individuals to contribute to our team. We have a good salary VAX 11/750s and there are opportunities for career advancement.

Our company is a leading manufacturer of computer based data processing systems. Our products are designed to meet the needs of a wide range of users, from small businesses to large corporations. We offer a complete range of services, including system design, programming, installation, and maintenance. Our products are known for their reliability, performance, and ease of use. We are currently seeking experienced professionals to join our team and help us continue to grow and expand our product line.

FOR FURTHER INFORMATION contact our advising consultant, MARSHALL CLIGMAN at Targa Computer Recruitment or at home (telephone EPPING 76085).

**Targa Computer Recruitment**

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The scope is outstanding. This is a company that can combine the confidence of leadership with technological excellence. Their reputation is built on a strong ability to think ahead, keeping them first, and foremost in the competitive electronics industry. Few can equal this component manufacturer and distributor, as they continue to break new barriers.

The complexity and diversity of their projects is something that is the key to professional achievement. Equally, they offer the impetus of one of today's most rapidly developing markets. They do not intend to just maintain their success, but to increase it still further, and that means making demands on every aspect of their environment.

Whoever joins our client now, must be capable of making a positive and significant contribution. There is no room for the 'average'. Their systems department which they now plan to expand significantly is the strength behind many of the company's key operational areas. Only ambitious and talented individuals will enjoy the responsibility of contributing to this development area of their D.P. Department. Which means involvement at levels ranging from

### SYSTEMS ANALYSTS to PROJECT LEADERS up to £15,500

To start with, eight people are immediately sought for new developments within the sales and marketing, manufacturing, accounting, personnel and office automation areas, working on their large MAINFRAME with distributed processing. Two years experience is looked for, although more is expected for the senior roles, as is previous leadership responsibility for significant projects. A sound commercial analysis background will identify you above all else for these posts. However, specifically for the manufacturing positions a knowledge of MAAPICS is also desirable.

The rural location in the North Eastern Home Counties, within easy reach of London, complements this attractive package. A full range of fringe benefits is offered, including 5 weeks holiday, a pension scheme, and generous relocation assistance where appropriate. Even more notable though, is the technical diversity, the on going development, the flexibility of involvement and the prospects. They all make this a challenge well worth the demands.

(4455)

Call Jill McGill on 01-734 9723 or 01-581 5829 evenings or weekends.

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## NATIONAL PARK ENVIRONMENT

### SYSTEMS AND SOFTWARE ENGINEERS AND ANALYST/PROGRAMMERS

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Working within a major Systems Services Group, career prospects are good, with vacancies ranging from Programmers to Project Leaders. Opportunities for project experience on a wide variety of applications exist in all cases.

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Applicants should have real-time applications experience and in-depth knowledge of one or more of the following:

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- DEC PDP 11 based systems.
- RSX or similar operating systems.
- CORAL, RTL2, PASCAL.
- Def. Stan. 0521 or similar.
- Multiprocessor communications.
- Hardware design and packaging on 8 or 16 bit micros.

Candidates with experience or potential to develop systems from inception to completion are sought, and rapid career progression can be expected.

Contact Steve Sykes or John Mason on Leeds (0532) 455911 during office hours, or Steve Sykes on 0904841350 evenings and weekends, or write to this address, quoting REFERENCE CWT.

MARKETING MANAGEMENT WITH TOP BRITISH MICRO MANUFACTURER

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£16K to £20K + BENEFITS PACKAGE

Research Machines' microcomputer systems have enjoyed remarkable success in the secondary and further education sectors and are well placed to gain a significant share of the rapidly developing primary sector. This has been achieved through a policy of designing systems specifically for educational applications; providing comprehensive support to educational users; responding to the needs of this marketplace; and a commitment to quality, performance, and reliability.

We are now looking for a Marketing Manager to take responsibility for this important area. The challenge facing the successful candidate will be to consolidate and develop our position in a market which is developing rapidly.

Your major responsibility will be to prepare, implement, and monitor a realistic marketing plan for profitable growth in the educational sector. This will include:

- detailed analysis of all aspects of the market;
- high level contact within education and government;
- definition of new product strategy;
- working with development teams on the definition of new products.

- providing marketing support to the sales team;
- monitoring performance and adjusting the plan as necessary.

Since the educational market also forms an important part of our export strategy, some overseas travel will be involved.

We are therefore looking for a mature, resourceful, imaginative, and numerate person with considerable analytical and negotiating skills. Probable qualifications include:

- a degree;
- good knowledge of the educational sector;
- sales/marketing experience — ideally in computing or educational technology.

Salary is unlikely to be an obstacle and we offer a particularly attractive benefits package including car; 25 days holiday; free BUPA, life and disability insurance; pension scheme; and generous help with relocation expenses.

If you are interested in this vacancy please contact Polly Keane on Oxford (0865) 726136 or write for an application form, quoting reference: NMEC/CW7.

**RESEARCH MACHINES**  
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## SENIOR PROGRAMMER VAX & PDP

BASIC + / + 2

£9K to £11K

City of London

Rolfe & Nolan Computer Services plc, is one of Europe's fastest-growing timesharing bureaux. Since formation in 1974, they have grown at a rate well in excess of 100% pa, and now offer a comprehensive range of services on a sophisticated DEC network supporting over 100 on-line customers and comprising:

2 x VAX 11/750; 5 x PDP 11/70; PDP 11/44.

To play a vital role in the development of new VAX-based systems for the financial sector, they now seek an ambitious young professional with at least 2 years experience of commercial programming in BASIC + or BASIC + 2 on DEC hardware; experience of RMS would be helpful.

You will be involved in all aspects of the design and programming of advanced systems using the very latest DEC hardware and software, liaising closely with clients and guiding junior programming staff.

You will enjoy excellent career progression in a rapidly expanding organisation wherein promotion is both rapid and based strictly on merit.

To arrange an early interview in London, contact Barry Latchford on the number below up to 7pm, or on Newick (082 572) 3197 evenings and weekends, or send a brief cv quoting Ref 685.

Barry Latchford Associates

Blair House, 7 Hazelgrove Road, Haywards Heath, Sussex RH16 3PH

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## CONTRACTS

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### System/34 Programmers Move up to System/38!

Start Salaries £7,000 to £15,000 + outstanding benefits

We are a rapidly developing consultancy organisation, serving clients in the IBM Small Systems sector throughout the Southern half of England.

We now wish to strengthen our team by adding a number of additional programmers and analyst/programmers who would like to work in a stimulating environment on a wide range of development projects using IBM System/38 hardware.

If you can offer us a solid background in RPG gained on any of the System/3, S/32, S/34 or S/36, then we will put you through our intensive retraining programme to enable you to work on our System/38 projects.

Michael Doran & Partners is a firm which believes in putting employees first. Our superb benefits package reflects this and includes:-

- Outstanding career advancement prospects
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To find out more about these outstanding opportunities contact Mike Doran in person either during normal office hours on Sevenoaks (0732) 460474 or, if you prefer, at home on Swanley (0322) 65985. FREEPOST, Sevenoaks, Kent TN13 2BR

**ANALYST/PROGS** £9-13,000  
**PDP/VAX**

Vacancies occur at various levels for persons with good BASIC, FORTRAN or similar programming backgrounds, to join a rapidly expanding systems house and consultancy. Excellent careers are available in either development or support roles working with banking systems, data communications or message switching applications in London and abroad. An attractive salary, reviewed at 6 monthly intervals is supplemented by a generous company benefits package.

**SYSTEMS ANALYSTS**  
**ICL/FINANCIAL****£NEG + PACKAGE**

A West End based financial institution requires further Analysts to participate in their systems development plan. They seek a minimum of 1 year's formal analysis preferably gained in an ICL/VME environment, a confident user approach and financial/insurance applications experience. Applications from candidates currently in the analyst/programmer role as well as experienced analysts will be welcomed, those with IDMS or TPMS exposure being of particular interest. All positions command a package to include bonus and after a qualifying period, a mortgage subsidy.

**PROGRAMMER** to £9,500  
**DEC/VAX**

Our Client, a City based trading company, has recently installed VAX equipment to handle their financial and commercial systems. They seek an ambitious Programmer with at least two years' COBOL experience to take an active part in their systems development. Whilst VAX exposure would be very relevant other hardware backgrounds will be considered. Every opportunity for advancement will be given and a negotiable salary will be enhanced by an excellent benefits package.

**ANALYST/PROGS** to £11,000  
**HP 3000**

2 London based sites are currently seeking experienced Analyst/Progs. An international company requires around three years' COBOL including some knowledge of IMAGE and VIEW to join their young team. Secondly an Analyst/Prog. with a minimum of 12 months HP BASIC is required by a professional company to work on a clients system in a troubleshooting capacity.

**ANALYST/PROG** to £11,500  
**BURROUGHS COBOL**

C. London company is currently looking for Analyst/Progs at various levels of experience to complement their successful team. Applicants should have a minimum of 18 months' COBOL, preferably gained on BURROUGHS CMS systems, however a good financial/commercial background will be considered. Candidates can expect a good deal of client contact and must therefore be professional in appearance and attitude. Good prospects and conditions.

**PROGRAMMERS** £NEG  
**COBOL**

Programmers and Senior Programmers are required by our Client an International Banking organisation. Candidates should have at least 18 months' COBOL gained in a commercial environment, a sound academic background and be effective communicators as the positions involve overseas travel and liaison with all levels of management. In return they offer good career prospects and perks which include a substantial annual bonus and mortgage subsidy.

**ANALYST/PROGRAMMER** £10,000  
**RPGII/III**

International bank has identified a requirement for an Analyst/Programmer with a solid GSD background. The bank is converting from a System 3 to a System 38. Applicants should have at least 1 year's programming with some systems experience in a GSD background (RPGIII would be of special interest). As well as a good starting salary a standard banking benefits package applies.

**ANALYST/PROGRAMMER** £9,500  
**RPGII/III**

Subsidiary of an international concern with a C. London base has a requirement for an Analyst/Programmer with at least 1 year's RPGII in a 34 environment. This is an ideal opportunity for a programmer to take on some analysis responsibilities since candidates do not have to have analysis experience. The department is fairly small and career prospects will be good.

**PROGRAMMER** £8,750  
**RPGIII TRAINING**

North Surrey-based company has identified a requirement for an RPG programmer. They are an established 38-user and have the in-house expertise to give full 38 training to existing RPG programmers. The minimum requirement is at least one-and-a-half years' RPGII, preferably from a 34-environment. As well as full RPGII training, the client encourages early exposure to systems.

404 4821

**Apex****Apex Computer Recruitment Ltd.**

London Office: 59 Groy's Inn Road, London WC1X 8TL Tel: 01-404 4821.  
Brussels Office: Rue Gatti de Gamond, 24, Uccle 1180 Brussels Tel: 010 122 377 4193

**MAJOR ICL DEVELOPMENTS IN ESSEX**

A leading independent Automotive Distributor with a heavy development commitment is seeking further Systems and Programming professionals to enhance their teams. There is a nationwide service network, handling the transportation of vehicles for the major British and Foreign manufacturers. The Essex based Data Processing Centre, utilizing ICL 2956 equipment is being upgraded to VME 2900 and all systems, both new and existing, are being developed for this environment. They require the following key staff for current and future projects.

**PROJECT LEADER**  
CIRCA £11,000

The developing project environment demands a key person with proven supervisory experience grounded on a strong analytical background to take a Project Leader's role. Candidates will already have seen at least one project through from design stage to implementation and will preferably have worked to a greater degree with ICL equipment.

**SYSTEMS ANALYSTS**  
TO £10,500

Should have one or more years' formal analysis gained in Financial, Commercial or Technical systems design. Communications abilities are of great importance to our clients since the analysts will be expected to liaise with users at all levels.

All positions carry a full Company Benefits package to include a good annual bonus and an attractive pension plan.

For further details about these challenging positions in a dynamic, growing but friendly group please contact Carl Smith at Apex.

404 4821

**Apex****PROGRAMMERS**  
£7,500 to £9,000

The prime requirement is for a commercial ICL COBOL programming background which must include a minimum of 6 months' VME experience. We would be interested in hearing from applicants at all skill levels and those with particularly strong COBOL/VME strengths will be rewarded accordingly.

**Apex Computer Recruitment Ltd.**

London Office: 59 Groy's Inn Road, London WC1X 8TL Tel: 01-404 4821.  
Brussels Office: Rue Gatti de Gamond, 24, Uccle 1180 Brussels Tel: 010 122 377 4193.

**C<sup>3</sup> Systems**  
**Berkshire/Surrey Border** £10-18K

Command and Control systems in the Defence field and for Emergency Services is one of our clients areas of expertise. To cope with new orders they need extra staff at levels from programmer to project manager. Previous relevant experience is essential. Excellent career prospects. Ref 2306/A

**Defence Systems**  
**North London** £9-14K

Mathematicians and Electronics Engineers with good degrees are needed for design, development and trials work on major new weapons systems. High calibre colleagues, tough but realistic deadlines and excellent facilities make this an exciting work environment which also offers plenty of opportunity for personal progression. Ref 2306/B

**Systems Engineers**  
**Surrey** up to £13K

Vacancies exist at all levels for CORAL programmers and microprocessor specialists to work on defence projects. They will join electronics engineers (more needed) to develop various types of system ranging from Fire Control to ECM. Our client can offer relocation to this attractive location. Ref 2306/C

**2900 Programmers**  
**Mid Surrey** up to £9K

Our client needs additional staff to join teams working in pleasant new offices. Financial applications knowledge (Insurance/Pensions) would be advantageous but two years' experience of COBOL and VME is essential TPMS being desirable. Some possibilities for travel. Ref 2306/D

**HP Analyst Prog.**  
**London & Overseas poss.** up to £13.5K

Expanding systems house offers exciting prospects to candidates with five years' experience, at least two years on HP 3000, to work on real time systems using IMAGE, QUICK, QUERY etc. Possible opportunities for overseas travel to Europe and North America, but most work will be done in London. Ref 2306/E

**Computer Professionals**

4, Kendrick Mews, London SW7 3HG Tel: 584 8790

**Programmers & Systems Analyst**  
**Surrey** £6.5-£12.5K

Rapidly growing Insurance company requires a Systems Analyst and Cobol Programmers to work on new developments. Database, CICS and Insurance industry experience are prerequisites for the Systems position and two years' COBOL (one year IBM) for the programming vacancies. Usual excellent Insurance Co benefits. Ref 2306/F

**Micro Programmers**  
**Beds** £8.5-12K

Vacancies exist for graduates with a minimum of two years' programming experience on micro computers (ideally 6800 assembler, PASCAL or RTL 11) to work on a range of microprocessor based POS products. The company has exciting growth plans and can offer first-class career prospects. Ref 2306/G

**Software Professionals**  
**Surrey Border** £10-18K

Expanding systems house has vacancies for staff at all levels to be involved in the development and installation of real-time, defence, communications and information systems. Knowledge of DEC PDP/VAX, DG, Tandem or Ferranti hardware and software preferred. Exciting work and swift career advancement. Ref 2306/H

**Systems Analysts**  
**West London** £8-12K

New systems using IDMSX and DDF in a large 2900 installation provide opportunities for analysts with proven development experience some possible as an analyst/programmer. Knowledge of IDMSX and retail applications is required for these excellent career openings. Ref 2306/I

**Analyst/Programmer**  
**London + Overseas Travel** £9-11K

A minimum of 12 months' on-line programming experience is required to join a team involved in the development and support of real-time software products for the UK and European insurance markets. Personal attributes are of prime importance and the opportunity exists to move into a specialist technical role. Ref 2306/K

**Senior Systems Designers**  
**Herts** £13K

A software house providing total systems solutions on mini and micro computers has vacancies for three real-time systems designers to work on scientific applications, medical applications and communications software. Fluency in Assembler and one or more of CORAL/PASCAL/BCPL together with relevant applications experience is essential. Ref 2306/L

**Communications**  
**London** £10-12K

An international communications company is about to invest in a major reorganisation of their message processing network and central database. Vacancies now exist for real-time programmers with experience of Intel 8086 or VAX (PDP 11 also considered) hardware and, respectively, PL/M or PASCAL/RTL2. Ref 2306/M

**Analyst Progs & Systems Progs**  
**North-West London** £10-14K

The UK subsidiary of a major US systems house has vacancies for programmers with sound COBOL or device handling experience to work on transaction processing and networking system. The company's products are implemented on TANDEM computers on which full training will be given. Ref 2306/N

**Systems Engineers**  
**London Based** £11-17,000

A large consultancy/systems house needs staff with research or defence project experience in the areas of navigation, signal processing, underwater technology, automotive engineering, electronics or communications. Candidates should be knowledgeable about good quality software and systems design. Ref 2306/P

**Yorkshire Regional Health Authority**  
**COMPUTER CENTRE****COMMUNICATIONS**  
**SPECIALIST**

**Technical Analyst Programmer**  
Scale 9 £8,367 to £10,277 + Proficiency Allowances of up to £554 according to exp.

The Authority is taking delivery of an ICL 2986 mainframe computer at this time and it is intended to develop a communications network throughout the Region. The latest ICL products are being introduced both centrally and at the remote sites and we need an experienced person to assist in planning, installation and day-to-day support of the network. The services to be maintained include MOP, MAC, RJE and TP using facilities available with George 3 PME and the VME 2900 Operating System.

A knowledge of ICL communications software would be an advantage though applicants with experience of other manufacturers' products will be considered. New entrants to the NHS will start at the minimum salary point progressing by annual increments through the scale.

Application forms can be obtained from the Regional Personnel Officer, Yorkshire Regional Health Authority, Park Parade, Harrogate HG1 5AH. Tel: (0423) 85081 Ext 108/109. Please quote Ref No. ACB. Closing date: 15 July 1983.

(4428)

**Metropolitan Borough of Rochdale**  
An Equal Opportunity Employer**TREASURER'S DEPARTMENT****TECHNICAL SUPPORT PROGRAMMER**  
£5,380-£10,071 £01/£02

**PROGRAMMER**  
£5,380-£10,071 (inclusive of 12.5% shift allowance. Scale 2/AP2 with a bar at the maximum of each grade. Starting salary dependent upon experience)

**COMPUTER OPERATOR**  
£3,200-£5,871 (inclusive of 12.5% shift allowance. Scale 2/AP2 with a bar at the maximum of each grade)

Applications are invited for the above posts. The Authority operates a 2000 mainframe, running under VME 2900 and supporting a large variety of work. There is a lively development programme planned which will substantially increase the 60 terminals currently in use.

Experience staff are required but consideration will be given to training in VME 2900 if necessary.

Application forms available (quote Ref No) from the Chief Personnel Officer, PO Box 66, Municipal Offices, Smith Street, Rochdale OL16 1XQ. Tel: 47474. For 982. To be received not later than Friday 18th July 1983.

(4429)

**WEST BANK**  
**Programmer**

for Palestinian university computer centre, computerising administrative systems, advising user departments, and possibly some lecturing. Fortran, Pascal, Cobol and HP 3000 experience desirable. Two-year contract with basic salary, but all costs (return fares, language tuition, etc.) covered.

Details from UNA International Service, 3 Whitehall Court, London SW1A 2EL. Please quote CW/1.

(4430)

**HAMPSHIRE COUNTY COUNCIL**  
**SOUTHAMPTON COLLEGE OF**  
**HIGHER EDUCATION**  
**SHIFT LEADER/FILESTORE**  
**LIBRARIAN**

(Post 180)

AP/5 (£5,873-£8,326)

(plus shift allowance of 18%)

The Computer Centre operates a VAX 11/780, microcomputers and an extensive terminal network. Two alternating shifts are in operation.

The ideal applicant will be self-motivated with an outgoing personality and has been to play an active role in the development of the Computer Centre. A knowledge of operations in an educational computing environment would be an advantage as would a good knowledge of filestore management, but the ability to learn and adapt to varied user demand is considered most important.

Further particulars and application forms available from:

The Finance and Staffing Officer, Southampton College of Higher Education, East Park Terrace, Southampton SO9 4WW.

Tel: 0703 3355.

Closing date: July 22nd, 1983.

(4431)

**JOINT MATRICULATION BOARD**  
**PROGRAMMER**

Applications are invited from programmers with at least two years' experience in IBM Assembler and/or COBOL (with CICS) to join a small programming team engaged in interesting work in the field of the GCE O-level and A-level examinations. At present the Board has an IBM 370/1 mainframe which is to be replaced in November 1983 by a 4331/11. Salary will be on a scale rising to a maximum £8,975.

Further information and application forms from the Secretary (Staff CW), Joint Matriculation Board, Manchester M6EU. (Tel: 061-273 2565).

**Analyst/Programmer**  
**Frequent North European Travel**  
**c.£13,000 p.a.**

Glaxo is a multi-national pharmaceutical group whose business is expanding rapidly. In response to increasing demand for better management information, both internally and with respect to the parent company, our North European subsidiaries are expanding their computer facilities and systems. This programme of expansion is being co-ordinated through our North European Office located at Greenford, Middlesex.

We are now looking for an experienced Analyst/Programmer who can work with and advise the companies concerned on their development programmes.

You will be educated to degree level and have good technical knowledge and experience of

Hewlett Packard equipment. Although based at Greenford, frequent visits to the North European countries, sometimes at short notice, will be required. You will be expected to show understanding and initiative in your dealings with staff of the subsidiary companies.

Starting salary, including guaranteed bonus and Outer London Allowance, will be in the region of £13,000 per annum. Excellent benefits include non-contributory pension, 25 days' holiday and season ticket loan scheme.

For an application form please write to: Miss P.A. Sandry, Senior Personnel Officer, Glaxo Holdings p.l.c., Clarges House, 6-12 Clarges Street, London W1Y 8DH, or telephone 01-493 4080 ext. 300.

**Glaxo** Holdings p.l.c.

For further information, write to Computer Professionals quoting the advertisement reference no; alternatively phone Isabel Bruce or David Fletcher on 01 584 8790



- ★ At least four years in D.P. with System 34 experience and possibly System 38.
- ★ Knowledge of a European language (Ideally Spanish) an advantage.
- ★ The ability to travel at short notice regularly through the year.
- ★ Two years of RPG II and one year of analysis and design.

A Multinational pharmaceutical company based in London need a dedicated professional to take responsibility on a day to day basis for the implementation, maintenance and running of various software packages at several sites in Europe.

Your duties will include training of local personnel in the operation and use of the system and the solving of daily problems from programming to analysis design. Contact will be with all levels of personnel from accounts clerks to the general manager in both small and medium size companies.

The system currently being installed is an integrated on-line business system. You will also be involved with the co-ordination and development of further systems.

The position is both challenging and exciting affording you a very definite career progression with a basic salary well into five figures and generous benefits.

Please telephone for an early informal discussion to: Richard Milsum on 01-354 1055 during office hours or on 01-958 2553 in the evenings and weekends. Alternatively please send full details to me at:

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## MINI-COMPUTERS ANALYST/PROGRAMMERS

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- ★ 3 YEARS + INCLUDING DATAPOINT MINI-COMPUTERS AND
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- ★ If no DATAPOINT experience, we will consider candidates with 3+ years' Mini-Computer experience plus COBOL (structured)

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To work on the coding, testing and installation of a planning/scheduling system in a manufacturing and maintenance environment.

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**SYSTEMS CO-ORDINATOR / MANAGER**  
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To work on a major hospital project the successful candidate will be responsible for the training of all medical staff in the implementation and use of an IBM 4331 based Patient Care system. Candidates will ideally hold a recognised medical qualification and have a knowledge of computer applications, usage and training. Alternatively, a computer professional with extensive hospital or related medical experience would be considered.

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Our client, the London based computer services division of a leading public company are currently building a new database support team and are seeking the following personnel.

### DATABASE SPECIALIST

Suitable applicants will have a solid design and programming background with an in-depth knowledge of COBOL, DMS1100 and QLP. They will also be familiar with DDL, SDDL and DMU utilities. Reporting to the Database Administrator, they will play an important role in the enhancement and development of several major database projects.

### DATABASE PROGRAMMERS

In addition to the above, our client is looking for several programmers with a technical and/or commercial background to complete their team. Suitable applicants will have 18 months plus experience of DMS1100 using COBOL. Prospects for advancement are excellent.

For further information telephone David Butcher on 01-903 9648

(4487)

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**IBM PROGRAMMERS to PROJECT LEADERS** **HERTS.** to **£19,000**  
Major commercial company requires Systems and Programming Project Leaders to meet their expanding development commitments. Sound technical IBM mainframe knowledge, plus ability to plan and control work for small groups of professionals essential. Programming specialists must have a minimum of 4 years' COBOL with a preferred knowledge of database. Ref: C633

**DATABASE DESIGNER** **MIDDXX/LONDON** c.**£16,000**  
Our client, a major Software Organisation, needs a Database Designer with IMS, IDMS, ADABAS or TOTAL experience. The successful applicant must have designed or have taken responsibility for the implementation of a major database management system. Ref: C680

**PROGRAMMERS & ANALYSTS** to **£16,000+ benefits**  
A large number of our clients situated in London, Home/Southern Counties need Programmers and Analysts to Project Leader level with PL1 or COBOL or BAL experience to develop real-time commercial systems, including Banking & Insurance, using CICS & DL1. Knowledge of CICS or SHADOW an advantage. Benefits include BONUS schemes, MORTGAGE and insurance facilities. Ref: C688

**SYSTEMS ANALYSTS** **LONDON** **£15,000**  
A large international organisation requires Analysts with at least 3 years' IBM mainframe experience. The ideal applicants will have a commercial background, together with PL1 experience and at least one successful project to credit. Database experience an advantage. Usual large company benefits apply. Ref: F420

**PROJECT LEADER** **MIDDXX.** to **£15,000**  
This large organisation needs someone capable of leading a team, with a sound working knowledge of FORTRAN or CORAL 88 with real-time experience, to take a leading role in a wide variety of applications. This position would ideally suit someone in their 30's, wishing to establish a career path in a fast growing electronics industry. Excellent training facilities and benefits. Ref: C621

**IBM GSD & DP PROFESSIONALS** to **£15,000+ profit share**  
Our client, a progressive software organisation, based in Kent, needs GSD and DP Programmers to Consultant level to work with established clients situated in London & S.E. England. A working knowledge of RPG 2 or 3 (GSD), COBOL or PL1, CICS/DL1 (DP) are essential for these challenging positions. Excellent career prospects and benefits include PROFIT SHARE, BUPA, Training given, where required. Ref: C677

**PROJECT LEADER** **LONDON** to **£15,000**  
Leading service company in oil exploration and production, needs someone with sound project control experience, ideally with a working knowledge of FORTRAN, to take control of a variety of projects. Knowledge of the oil industry an advantage. Ref: C644

**SENIOR SYSTEMS ANALYST** **HERTS.** to **£15,000**  
Our client, a leading company in the retail industry, are seeking someone with a proven record of systems implementation and large scale project involvement, preferably gained within an IBM DOS/VSE environment. The company is also offering an excellent benefits package. Ref: A673

**PROJECT LEADER** **LONDON** **£14,000+**  
A leading communication organisation requires someone with analysis and programming experience to lead their software development team. A knowledge of PLM or ASSEMBLER & TEXAS hardware would be preferred, as would experience of Real-time communications. Ref: F622

**IBM SYSTEMS ANALYSTS** **W. LONDON** c.**£14,000+**  
**Bonuses**  
Leading manufacturing company needs Analysts with 2-3 years minimum, essentially with COBOL & CICS expertise to meet their demands for major new development work. A knowledge of DL1 would be advantageous. Ref: B672

**IBM COBOL PROGRAMMERS** **SURREY** to **£14,000**  
A number of our clients are seeking experienced IBM MVS & DOS/VSE, CICS Programmers to senior levels. Successful applicants will be assigned to the development of a variety of commercial projects, including Banking and Insurance. All positions offer excellent fringe benefits. Ref: A628

**RPG 3 ANALYST/PROGRAMMER** **MIDDXX.** to **£14,000**  
The ideal applicant will have a minimum of 12 months' RPG 3 experience to work on a variety of projects within the Software department of a leading commercial company. RELOCATION will be paid, where applicable. Excellent salary and company benefits apply. Ref: B689

**DEPUTY D.P.M.** **HANTS** **£13,000+**  
This position would suit an Analyst/Programmer who has approximately 4 years' experience of RPG 2 and approximately 18 months' experience of RPG 3 gained within a commercial environment. Ref: F674

**IBM PROGRAMMERS** **MIDDXX.** to **£13,000**  
A leading Software House requires COBOL Programmers with 2 years' experience in a commercial environment. Knowledge of CICS & DL1 is desirable to deal with the company's varied applications. Ref: F448

**TRAIN in RPG 3** **N. LONDON** to **£12,500+**  
**MORTGAGE**  
Our clients, a leading financial organisation currently requires Programmers with a minimum of 2 years' RPG 2 experience, preferably gained on a System/34, or 8 months' RPG 3 expertise. Excellent salary and working conditions apply together with a very generous MORTGAGE subsidy. Ref: B670

**RPG 2 PROGRAMMER/ANALYST** **CITY** c.**£12,000+**  
**MORTGAGE**  
Major Banking organisation needs someone with at least 2 years' RPG 2 experience for their twin system/34 site. The successful applicant must be prepared to undertake periodical OVERSEAS trips. Various financial benefits include a 5% MORTGAGE facility. Ref: B678

**DEC ANALYST/PROGRAMMER** **LONDON** c.**£12,000**  
A leading Software House requires people with RSX 11 or VMS together with COBOL, ideally with Banking or Financial experience to maintain and develop new major Banking systems. Ref: F684

**PROGRAMMERS & ANALYSTS** **LONDON/HANTS** c.**£12,000**  
Our client, a leading Software Organisation needs Programmers and Analysts to perform Customer Support roles within the U.K. and abroad. Applications include banking and other financial applications together with communications software and hardware support. Applicants must have COBOL or BASIC (+), or AIMS, together with good communicative skills, and be prepared for occasional worldwide travel. Experience of DEC VMS, RSX 11 or RSTS/E would be an advantage. Excellent training facilities and opportunities for advancement in a fast-growing market. Ref: C686

**MICRO SYSTEMS ANALYSTS** **HERTS./LONDON** to **£12,000**  
Large industrial organisation requires Analysts with at least 2 years' Systems experience, and knowledge of commercial packages to design and modify their clients applications. BASIC or PASCAL would be preferred, though not essential. SIRIUS experience would be an advantage. Ref: F602

**FORTRAN SPECIALISTS to TEAM LEADER level** to **£12,000+ benefits**  
Major software organisation in London needs Programmers to Team Leader level to work on development of a wide variety of client support systems. HP 3000 useful. Excellent prospects and benefits apply. Ref: C607

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The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives

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The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives

**ANALYST/PROGRAMMER** **LONDON** to **£12,000**  
Leading financial organisation requires someone with ICL COBOL and 2 years' analysis experience. A knowledge of IDMS, DDS would be advantageous. The successful applicant will be assigned to the development of financial applications with an emphasis on analysis. FAMILY MEDICAL COVER & FREE LIFE ASSURANCE are just some of the benefits offered. Ref: A607

**DEC ANALYST/PROGRAMMERS** **LONDON** to **£12,000**  
Major Software House requires Analyst/Programmers with RSX 11 or VMS & COBOL, ideally with banking or financial experience. Applications include the testing and evaluation of various software packages. Knowledge of TURNKEY SYSTEMS and the ability to supervise are an added advantage. Ref: F620

**IBM PROGRAMMERS** **W. LONDON** c.**£11,000+ Bonuses**  
A minimum of 18 months' COBOL or RPG 2 is required to work on major new developments for this well-known manufacturing organisation. Knowledge of CICS/DL1 would be an added advantage. Ref: B671

**FORTRAN SPECIALISTS** **LONDON/HOME COUNTIES** c.**£11,000**  
Programmers are required to join existing development teams to work on a wide variety of applications including scientific, research, engineering and commercial projects using minis and mainframes. Excellent benefits include annual BONUS/PROFIT SHARE. Ref: C622

**IBM PROGRAMMER** **BUCKS.** **£11,000**  
This position would suit someone with 3 years' COBOL programming experience in a scientific or commercial environment. Our client's site is an IBM 4331 running under DOS/VSE. Knowledge of CICS or DL1 would be advantageous. Ref: F422

**PROGRAMMER** **HERTS.** to **£11,000**  
Large manufacturing organisation is seeking someone with 2 years' IBM COBOL/CICS experience for the development of new commercial systems. The successful applicant will be given every opportunity to progress into analysis. Excellent benefits and conditions. Ref: A432

**TRAIN in RPG 3** **SOUTH COAST** to **£11,000**  
Leading distribution organisation needs two self-motivated Analyst/Programmers to develop commercial applications on their IBM System/38. The successful applicants must have 2 years' RPG 2 experience together with a proven record in analysis. Benefits include P.P.P. & FREE LIFE ASSURANCE. Ref: A627

**SYSTEMS ANALYST & PROGRAMMER** **HANTS COAST** c.**£10,500**  
Major commercial organisation needs an Analyst and a COBOL Programmer to assist with the development of their commercial applications in a DOS/VSE CICS/DL1 site, using distributive processing. Excellent prospects and fringe benefits. Ref: C622

**COBOL PROGRAMMER** **LONDON** **£10,000+ benefits**  
International finance company needs someone with 2 years' ICL COBOL experience to help develop major insurance applications on their ME28. A knowledge of TPS is essential. Excellent fringe benefits apply. Ref: A661

**DATABUS PROGRAMMER** **HERTS.** **£8,000+ benefits**  
A leading manufacturing company requires someone with 18 months' DATABUS experience to join their dynamic team. The successful applicant will be required to develop new on-line commercial systems and will also gain exposure to IBM 4300 hardware and software facilities. EXCELLENT PROMOTION PROSPECTS. Ref: A436

## OPERATIONS

### MVS SENIOR OPERATORS to SHIFT CONTROLLER

**£10,500 to £14,000**  
Leading organisation in Middx. requires Senior Operations staff to Shift Controller level to complement their expanding teams. Excellent prospects and benefits including RELOCATION costs, where applicable. Ref: C626

**TECHNICAL SUPPORT** **WEST COUNTRY** c.**£12,500**  
Experience of either ICL VME/B or HONEYWELL DPS4 is required with someone who has worked within a Technical Support role for at least 3 years, preferably with familiarisation of TP/Database. Full RELOCATION costs apply, where applicable. Ref: B667

**IBM OPERATORS** **WEST LONDON/MIDDXX.** to **£9,000**  
Our clients, both leading manufacturing organisations are seeking Operators with a minimum of 18 months' DOS/VSE experience, ideally with CICS & VM. Both sites operate a 2-shift system, and offer excellent career paths. Ref: B688

**PRODUCTION CONTROLLER** **LONDON** c.**£8,500**  
The ideal applicant should have sound UNIVAC 1100 expertise together with JCL. He/she will be involved with the controlling of input data, job generation and set-up, and preferably have knowledge of SSG and MAPPER. Days only. Ref: B628

**DATA CONTROL CLERK** **LONDON** **£8,100**  
Large financial organisation needs someone with at least 2 years' experience in an MVS environment. Working knowledge of JCL essential. Excellent benefits. Ref: C626

**OS/VS1 OPERATOR** **SUSSEX** c.**£7,400+**  
Two years' OS/VS1 experience is required for this 2-shift system. Excellent benefits and opportunities for career advancement. Ref: A362

**ICL OPERATORS** **LONDON** c.**£7,200+**  
Leading financial organisation seeks Operators with either VME/B or DME GEON experience for their expanding operations division. A 3-shift system is worked, and excellent monetary benefits are offered, including MORTGAGE facilities. Ref: B666

**DATA CONTROL CLERKS (ANY MAINFRAME)** **LONDON** c.**£7,100+**  
Our clients, a large International Banking Organisation, seeks experienced Data Control Clerks for their new department. Excellent company benefits include MORTGAGE, Free Life Assurance, etc. Ref: B688

**IMMEDIATE CONTRACTS**  
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PL1, IMS 3 months  
PL1, IMS 3 months  
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COBOL, MCP, CANDE, DMS, WFL 2 months  
OPERATOR — VMS or AIMS 3-8 months

**Tel: 01-634 0061 (24-hours)**

Or call evenings and weekends  
REF. A: 01-639 7548  
REF. B: 01-794 6937  
REF. C: 01-942 1178  
REF. F: 01-438 2670

(4461)

*your appointments register*

## Programmers

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## Software Engineers

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COMMS/TELECOMS/MOD to £14K  
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Our clients, a major United States software corporation, are looking to appoint an experienced individual, based in Paris, to help support their international marketing operation.

The corporation has many hundreds of users in Europe, and markets a wide range of IBM based products, particularly in the communications and database fields.

The role will include supporting the sales effort before installation and assisting users, from an applications viewpoint, post installation. We require IBM mainframe skills, preferably including CICS and IMS, with practical database experience. An excellent understanding of commercial application and industries is needed.

An extensive amount of European travel will be offered and thus a single person is strongly preferred. The ability to speak fluent French or German is essential.

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## SYSTEMS PROGRAMMERS

£8,000 to £15,000

Our Corporate aim is to become the acknowledged world leader in CAE, and we are looking for Systems Programmers to join our development teams. If you excel as a computer professional, or believe that given the right environment you could excel, working in any of the specialist areas listed below, then you should contact us immediately about improving your career prospects.

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As a result of their new product launch, they now wish to recruit Senior Sales personnel who will have at least 3 years successful sales experience within the mini computer systems market, coupled with the ability not only to negotiate at the highest level but also to have been involved in competitive sales situations.

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We feel that this is a rare opportunity for sales professionals to join a highly dynamic company, where creativity and job satisfaction are but two of the benefits waiting for the right applicants.

**CTA**  
RECRUITMENT CONSULTANTS

For an immediate confidential interview where you will be supplied with full company information, contact RICHARD CHAMPION on 021-236 1999 (24 hour answering service) or Hagley 884166 evenings and weekends. Candidates are invited to submit a Curriculum Vitae if preferred, where confidentiality is guaranteed.

**Cathy Tracey & Associates Ltd**

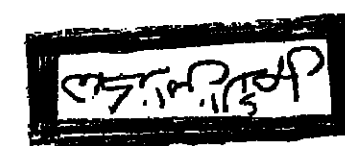
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1-3 NEWHALL STREET  
BIRMINGHAM B3 3NH  
TEL: 021-236 1999 TELEX: 825264

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# Senior Sales Executive

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Please send ovs or contact:

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4th Floor, Bilton House  
54/56 Uxbridge Road  
Belling, London W5 2TJ  
Tel: 01-840 3282  
(reverse charges)

MANCHESTER  
Jane Smythe  
3 Wynnstey Grove  
Fallowfield  
Manchester M14 6XG  
Tel: 061-948 7100  
(reverse charges)

(4486)

## UNIVERSITY COLLEGE LONDON Department of Computer Science

### LECTURESHIP

The Department wishes to fill a vacancy at the Department of Computer Science with an applicant interested in both teaching and research. The areas of expertise should include at least one of the following:  
Theoretical aspects of Computer Science; systems theory and software engineering; programming languages; language architecture and computer architecture; computer architecture and technology; intelligent knowledge based systems; numerical methods and applications. Interest and ability to teach programming methods and applications. In the case of an exceptionally well qualified candidate, it may be possible to make an appointment as Senior Lecturer level.

### RESEARCH ASSISTANTSHIPS

There are also two vacancies for research assistantships on grant-funded projects in computer networks and office automation. A first degree is required, and experience with UNIX and C would be desirable, and graphics or data communications experience would be an asset.

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Further particulars are available from: Assistant Secretary (Personnel), University College London, Gower Street, London WC1E 6BT (4328)

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For further information, or to make an application, please contact: Dr P. J. Howlett, Western Regional Department of Nuclear Medicine, 3 Level, Centre Block, Southampton General Hospital, Telephone: Southampton 777222, extension 344. Closing date: July 28th, 1983. (4476)

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We are looking for people who want to be part of our growing team. The rewards are obvious for someone who wants to participate in a small dynamic operation that offers involvement in all aspects of our growth. You need System 34/38 IBM experience or MICRO experience with BASIC or PASCAL. We are looking for people who can cope with a changing, demanding environment with the drive and energy to succeed where more than just a secure job is at stake. Work towards a future with us and you'll have one.

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IBM IMS ADF PROGRAMMERS  
IBM DOS COBOL SENIOR PROGRAMMERS  
IBM SYSTEM/34 MAAPICS ANALYST/PROGRAMMERS  
IBM PL/1 MVS/IMS JACKSON PROGRAMMERS  
IBM PL/1 IMS/MVS ANALYST/PROGRAMMERS  
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## IBM NORTHERN CONTRACTS

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Preference will be given to applicants whose interests are in one or more of the major fields of non-numerical computing particularly programming languages, artificial intelligence, database systems or operating systems. The successful applicant will be required to take part in undergraduate and postgraduate teaching and to undertake research.

Staff benefits include 75% remission of tuition fees for dependants at UCT, generous research leave, an attractive housing subsidy, pension, medical aid and group life assurance.

Applicants should submit a curriculum vitae stating research interests and publications, experience, present salary, the date duty could be assumed and the names and addresses of three referees.

Further information may be obtained either from Mr J Hennings, SA Universities Office, Chester House, 278 High Holborn, London, WC1V 7HE, or from the Registrar (Assistant: Appointments Office), University of Cape Town, Rondebosch 7700, South Africa, by whom applications (quoting ref. no. CP/362) must be received not later than 31 August 1983.

The University's policy is not to discriminate on the grounds of sex, race or religion. Further information on the implementation of this policy is obtainable on request.

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DEPARTMENT OF MATHEMATICAL SCIENCES AND COMPUTING

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Salary will be in the range: £11,822 (x 6) £14,382 p.a. } Inclusive of London Allowance  
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Starting salary will be dependent on qualifications and experience. It is hoped to appoint suitable candidates without delay and so immediate application is advised. Further details of the Department and its activities together with an application form, may be obtained from the Staffing Office. Tel: 01-928 8989 Ext 7355 (4526)

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For informal discussion please contact Mr Broome, Ext. 256 and for further details and application form contact Susan Phillips, The Civic Centre, High Street, Kingswood, Bristol BS15 2TR. Telephone (0272) 601121, Ext. 212, quoting post reference GFO/53.

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## CONTRACTS

SYSTEMS PROGRAMMER - IN DEPTH VM EXP. (London) £Neg  
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### Office Automation Berks/Hants: Salaries to £16K

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### Communications Consultants

Inner London: Salaries to £18K

A highly regarded Systems House is seeking a number of Communications Consultants for its Central London Head-quarters. Successful candidates can expect to join project teams undertaking development work utilising the most advanced techniques available and they will, therefore, considerably enhance their skills. Ideally, applicants should be aged 28-35 years and be educated to at least B.Sc. standard in Computer Science or a related discipline.

You will be expected to possess a thorough knowledge of at least two of the following:-  
• Communications Protocols e.g. X-25  
• ISO standards  
• Office Automation Systems and Networking techniques  
• Market Development  
• Systems Design and Consultancy  
• Familiarity with UNIX or a look-alike product  
A sound software development background is essential and will preferably have been gained with a computer manufacturer or Systems and Software House. Good personal communication skills are also important since successful candidates will be expected to make presentations to clients and prepare reports and recommendations to exacting deadlines. Ref: AS/2

### RSX/VMS Progs

London & H. Counties: Salaries to £13K

The Communications Division of a leading Systems Supplier and Consultancy is currently seeking additional Systems Programmers. Suitable applicants should be graduates with a minimum of two years' software or systems design experience within a PDP/RSX-11M or VAX/VMS environment. It is essential that you should offer fluency in Assembler and that you are fully familiar with the internals of RSX-11M or VMS. Additional knowledge of a high level language e.g. FORTRAN or PASCAL would be a distinct advantage, as would experience of working within a data communications or distributed processing environment. Applicants who demonstrate management potential or those who already have some project leading experience will be considered for more senior positions within the project teams. Ref: L/26/C

### Systems Software

Herts/Beds: Salaries to £14K

The Applied Systems Division of a leading Systems House and Consultancy requires additional Systems Software Specialists from Programmer to Senior Designer level. All applicants should be educated to B.Sc. standard and have at least two years' experience within a real-time scientific mini-computer or microprocessor environment. It is essential that you offer fluency in an Assembler and one or more of CORAL, PASCAL, BCPL or 'C'. For the senior positions, applicants should have experience in the specification, design and implementation of systems software. In particular, knowledge of language systems, interface handlers, X-25 protocoling techniques or local/area networks will be highly desirable. Ref: L/26/D

### Operational Research

London: Salary to £13.5K

A number of Operational Analysts are required by this London-based Consultancy. Academically, you should hold at least a first or second class B.Sc. Degree in Mathematics, Physics or Statistics. An M.Sc. or Ph.D. in Operational Research is a distinct advantage and will certainly reflect in the salary offered. Past work experience should include one or more of the following areas: war gaming and scenario studies, mathematical programming and analytical modelling, navigation systems assessments, reliability studies and data reduction. An important feature of these positions is the ability to communicate software and O.R. techniques to non-technically minded personnel. There will also be a degree of travel to clients' sites. Ref: L/26/E

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## MANUFACTURING JOBS

# Expanding sector seeks fresh blood

Margaret Park discovers numerous vacancies exist in electronics and computer manufacturing firms

DESPITE the gloomy tales about a dearth of jobs for new graduates and a scare two years ago when ICL told more than 100 expectant graduates that their promised jobs no longer existed, places with the big electronics and computer manufacturers are fairly numerous for this year's university and college leavers.

New graduates, in fact, have a better chance of getting in than anyone else. Whereas the manufacturers set aside a certain number of jobs for each year's graduate intake, slow turnover means that fewer vacancies arise for experienced people.

ICL, recovered now from its embarrassment of two years ago, has a healthy intake this year of 68 graduates destined to be programmers or analysts.

All of the big companies use the university milkround method of recruitment.

For the employers the system is ideal. Every finalist is anxious about the chances of finding a job, so students apply for the milkround interviews in their thousands.

After this session, companies

have yet another chance to display themselves at the summer recruitment fairs. They are open to all students, including those from neighbouring polytechnics.

ICL says it has approximately 20 places for programmers left over from the milkround.

Increased competition for jobs with the manufacturing and electronics firms means that arts graduates rarely get a look-in. GEC Computers says it only recruits arts graduates for jobs as technical authors. This summer the company was after 30 new graduates for posts as systems engineers working on the development of both hardware and software.

The preferred disciplines, says GEC, are maths, physics, electronics and, of course, computer science.

For non-graduates the best way into the manufacturing firms is through the service division or customer engineering. GEC will take applicants up to the age of 25 with the TEC 3 or TEC 4 certificates (the equivalent of an HND or HNC).

All GEC's new recruits are

thrown straight into project teams. "We don't believe in the Cook's Tour of training," says a personnel officer. "We believe in putting them to work straightaway and after 12 months newcomers will already have taken considerable technical responsibility."

New employees are given an initial four weeks' training at GEC and allotted a specific set of responsibilities straightaway.

New products mean new jobs and both GEC and CTL, the mini manufacturer, are expanding their product development teams as well as needing extra support staff for brand new kit recently released.

GEC is after between 60 and 70 experienced people to work in development, marketing and support. The company has just launched its Series 63 super mini, is working on a telephone billing system and has various videotext projects on the drawing board.

"The prospect is fairly daunting," says personnel manager Ivan Hickmott. "It's a very big recruitment task. We don't use systems analysts so the majority of the people we need will be systems development programmers."

Electronics giant Ferranti is up



ICL has a healthy intake this year of 68 graduates.

Because of the number of people the company is after, GEC has dropped its required level of experience from two years to one.

CTL has recently launched its 9000 Series and plans to expand the company's head count by 15% over the next 12 months.

More than 50 staff have been taken on in six months and now the company is after product development people, applied systems designers and service engineers.

Most of these will be experienced staff, but CTL says it often takes TOPS students to be service engineers.

Manufacturers cannot afford to

let the grass grow under their feet in terms of new developments. This explains their steady recruitment from the universities and polytechnics.

But the competitiveness of the business of systems design means that only the best get in. Most of the big firms are either looking for considerable software or hardware expertise, or are anxious to snap up fresh blood that they can train from scratch to their own specifications.

The inexperienced or those hoping to change careers after some years out of university stand less chance.

## OPPORTUNITIES IN SOFTWARE HOUSES AND BUREAUX

### RECRUITMENT FEATURE JULY 14

This feature, with full editorial support, highlights job opportunities in this part of the industry.

For more information contact:

01-661 8080 (DIRECT CLIENTS)  
01-661 8787 (CONSULTANCIES)

### Top flight programmers

SAS

- ◎ Systems
- ◎ Applications
- ◎ Software

A Division of TRIAD Computing Systems Limited based in Guildford, Surrey needs talented and adaptable programmers to work on:

- ◎ real-time systems for industry and the public sector
- ◎ engineering and scientific applications
- ◎ basic software with special emphasis on database and file management.

We are looking for people with high ambitions and offer rapid progress on merit, to positions of responsibility in systems design and project management. Salaries to £11,000 p.a. plus bonus and usual benefits.

TRIAD

Write to: Alison Patten, Systems & Applications, TRIAD Computing Systems Limited, 201/203, Guildford Street, Guildford, Surrey GU1 2PP.

## MANUFACTURING JOBS

## Technical Support Manager Business Systems c.£13K

Plessey Avionics & Communications, a major and highly successful enterprise in the field of defence electronics, is seeking a Technical Support Manager for its rapidly expanding range of computer hardware, systems software and communications equipment.

A function of this key appointment will be to plan and control the development, installation, implementation, on-going maintenance and performance monitoring of all systems software. This covers operating systems, utilities, compilers, program development and office productivity tools, and the provision of a technical planning and consultancy service for all users of computer systems within the business.

Candidates, male or female, should have at least two years experience of working in a similar role on DEC or HP mini-computers within an ICL mainframe environment.

Starting salary up to around £13k. Generous benefits include pension scheme with free life assurance, BUPA cover and relocation package where appropriate.

To apply, please write to Graham Mayes, Personnel Department, Plessey Avionics & Communications Limited, Vicarage Lane, Ilford, Essex IG1 4AQ. (Tel. 01-478 3040 ext. 2256).

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## Shift Manager

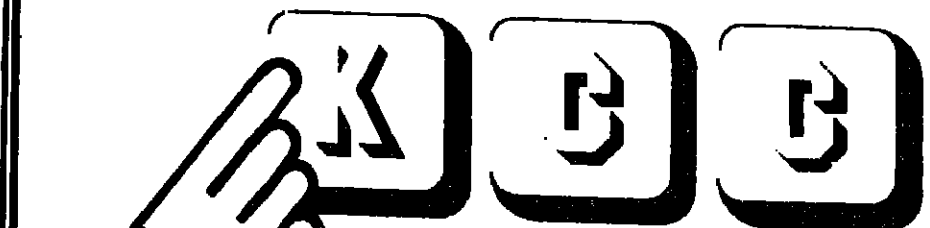
Southern Germany  
Dm Excellent

For a leading international banking organisation to work in the prestigious new data centre located in the suburbs of Frankfurt a. Main. Our client is looking to establish a high calibre operations team and is seeking applications from career minded individuals to fill the key position of Shift Manager.

The ideal candidate will have a minimum of five years experience of large IBM mainframe operations and will be fully conversant with MVS and IMS. Ideally he/she will be in their mid to late twenties with broad based experience of IBM operations, international user liaison and mainframe/mini computer networking concepts. Particular emphasis will be placed on supervisory skills on both a management and technical level and the ability to communicate with multi-national users in a problem determination role.

A comprehensive benefit package including mortgage subsidy, personal loans etc. is offered together with the excellent base salary. A relocation allowance is available where appropriate. The financial conditions of employment will ensure a high standard of living in a flourishing area of Germany.

Initial interviews will be held in London. Please contact Christine Andrews for further information.



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## A different kind of Software Challenge

from a different kind of company

### Software Specialists Basingstoke

Digital is a different kind of company. In little more than 25 years, we've grown rapidly to lead the world in the design, manufacture and marketing of interactive computer systems. And we're still growing — currently at the rate of almost 30% a year.

That's why we're now looking to strengthen our Customer Services Support Team by appointing ambitious young Software Specialists, providing advice and assistance to our valued customers to help them get the best out of their Digital systems.

As we said, this is a different kind of software challenge. We are developing a team with in-depth technical expertise aimed at providing total software solutions to the customer. Your knowledge and advice will be required in a variety of situations, ranging from handling user level enquiries to diagnosing and fixing complex operating system problems. And the rewards are excellent. To make the grade as a Software Specialist

with Digital, you should be aged 23 to 30, degree qualified with at least 2 years' relevant experience on VMS or RSX. You'll also need good communicative skills and proven abilities to identify and resolve software problems.

If you're the person we're looking for we'll offer you an attractive salary, and a full range of fringe benefits including relocation if necessary. And of course, the knowledge you gain in this field will prove invaluable in helping you to progress within our young organisation.

So, if you're a Software Specialist looking for a different kind of challenge with a different kind of company, write immediately with your detailed c.v. to: Ron Leggat, Digital Equipment Co. Limited, Customer Services Support Centre, Jays Close, Viables Industrial Estate, Basingstoke RG22 4DE. Tel: Basingstoke (0256) 56101. Ref: TSC/496.

**digital**

# Merchant Banking

City of London

Our client has twin UNIVAC 1100/60's servicing a network which is currently being expanded to support over 100 micro-computer based terminals. If you join this well-established DP department you will be producing systems for one of the City's leading Merchant Banks and will, therefore, be gaining the following valuable benefits in addition to the salaries quoted.

- Mortgage Subsidy
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- BUPA
- Interest-free Season Ticket Loan

Please contact Joan Ainsworth on 01-681 8311 or write to her at C.S.S., 6th Floor, Carolyn House, Dingwall Road, Croydon, Surrey, CR0 9XF.

## Analyst/Programmers

£9,000 to £15,000 plus benefits

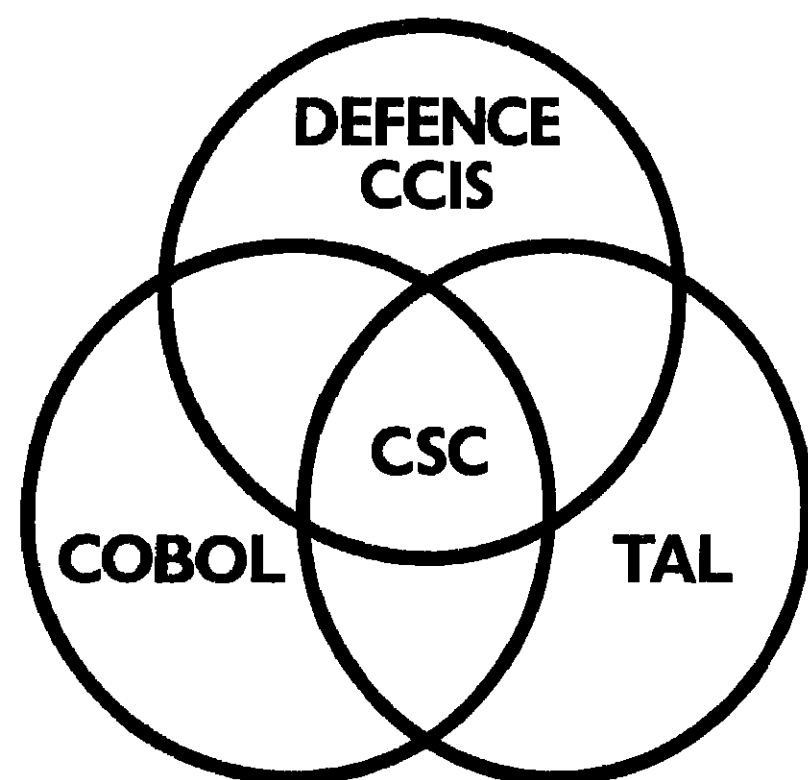
Our client is working on a wide variety of financial systems and, in addition to a sound background in COBOL programming, is looking for experience of some of the following:

- Investment systems including Portfolio Management and Valuations
- Dealing Room Systems
- General Banking Systems

Previous design and implementation experience is called for, together with the ability to liaise with users at many levels.

Computer Search & Selection (Southern) Ltd

CSC



## DESIGNERS/IMPLEMENTORS

Home Counties

c.£12K-13K

As part of the World's largest equipment-independent systems company, CSC UK has a strong reputation for the implementation of large systems in Defence and Government.

We require additional designers/implementors to join technically advanced project teams working on major Command and Control Information Systems (CCIS).

Candidates must have three or more years' experience and ability to problem solve. They must be able to work without close supervision and be able to communicate. Experience must include two of the following:

- ★ COBOL
- ★ TAL, or similar block structure language e.g. CORAL
- ★ Large Project background

For further information please telephone Jenny Dalrymple-Hay or Ian Murray West on 01-493 2947 (to 9pm Monday-Friday) or weekends respectively, Beaconsfield (04946) 4579 or Milton Keynes (0908) 563415 quoting reference 9988.

(4478)

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### COMPUTER PROGRAMMER

c. £7,500

Based in Stratford-upon-Avon

**THE COMPANY:** An expanding and successful subsidiary of United Biscuits, manufacturing & ice cream frozen foods.

**THE JOB:** To assist Computer Services Manager to maintain existing programmes and extend computer utilisation within the Company.

**THE APPLICANTS:** Must have at least two years' APG II experience on an IBM System 34, aged between 20-30 and wish to further his/her career.

**THE BENEFITS:** Pension Scheme, subsidised meals, discount staff rates and all the other benefits of working for United Biscuits.

**INTERESTED?** Please telephone or write for an application form 191.

Mr N. C. Hoed, Personnel Officer  
Abbeville Kiln, Watlington Road  
Stratford-upon-Avon, Warwickshire CV37 6BH  
Tel: (0783) 88411 (4534)

### SCOTTISH WEST COAST HEALTH BOARDS (RE-ADVERTISEMENT)

#### MICROCOMPUTING SPECIALIST

Salary £8,267-£10,277 per annum

This is a new post in the Technical Services Team of the Computer Department, Argyll and Clyde Health Board which is located in the centre of Paisley. The department services the Argyll and Clyde, Argyll and Arran, Dumfries and Galloway and Western Isles Health Boards.

Applications for the post are invited from persons with several years' experience in computing in general including both systems and programming work. In particular, previous experience of microcomputers, software and application packages is essential, together with a high degree of skill in communicating with users at all levels. The main function of the post is to provide assistance to various people, in different disciplines of the health services, on all aspects of microcomputing. An important aim is to assist in establishing standards on microsystems selection and use.

Application forms and further particulars may be obtained from: The Area Personnel Officer, Argyll & Clyde Health Board, Gilmour House, Paisley PA1 1BU. Telephone 041-827 0131, Ext. 222. Closing date for applications is 22nd July, 1983. (4532)

The Council's computer installation is based on two ICL 2986 computers supporting a County-wide network including five ME29s and over 150 terminals. The Council is committed to both the implementation of VME and an ambitious development programme. To support these projects a number of additional posts have been created and, initially, the following appointments will be made:

### Systems Analyst

£8,658-£10,071 p.a.  
(pay award pending)

Applicants must be able to demonstrate a sound background in analysis and design.

### Analyst/Programmer

£7,791-£10,071 p.a.  
(pay award pending)

A minimum of four years' relevant experience is required. Knowledge of TPMS and Data Dictionary would be an advantage.

### Junior Programmer

£2,583-£8,325 p.a.  
(pay award pending)

Applicants should have up to one year's experience of COBOL/RANGE COBOL.

For further information on these posts, ring Ian Pearce, Truro (0872) 71798.

### Programmer

£2,583-£8,325 p.a.  
(pay award pending)

To join a small team of Highways Engineers to assist in mainframe development, including conversion to VME. Applicants should preferably have an appropriate University qualification and be competent in COBOL and FORTRAN. For further information, ring Mike Aspdon, Truro (0872) 74282, Ext. 137.

### Systems Programmer

£7,791-£10,071 p.a.  
(pay award pending)

Starting salary dependent on experience. For further information, ring Roy Coaway, Truro (0872) 74282, Ext. 282. Experience of a VME environment is preferred.

Application forms are available from: The County Treasurer, County Hall, Truro, Cornwall TR1 3BD. Closing date, 15th July, 1983. Please quote reference No. 120, when replying. (4285)

Cornwall

## Statistical Programmer

Cheshire,

c.£7,750

As a member of our Research Statistics team at this major research centre, you'll provide essential statistical programming expertise in a team comprising Statisticians and Statistical Assistants.

This new team role, which will involve writing programmes and carrying out statistical tasks under the supervision of a Statistician, provides a first rate career development opportunity.

With sound experience in technical computing, preferably of IBM systems, and ideally knowledge of at least one high level scientific language e.g. Fortran, you will have the ability to work as a member of a team and possess good communication skills.

Experience of statistical software, particularly SAS, an understanding of statistical concepts and experience of working in a similar environment are desirable factors.

In addition to a first class salary, conditions of employment are excellent and relocation assistance will be given, if appropriate.

Our research laboratories are situated in pleasant surroundings in one of the most beautiful parts of Cheshire, close to Alderley Edge, Wilmslow and Macclesfield. Road and rail links are good and the city of Manchester is only 30 minutes away.

Applications in writing, including a detailed cv and quoting reference No. ICP 785, should be addressed to: Mr. V.A. Mole, Personnel Officer, Imperial Chemical Industries PLC, Pharmaceuticals Division, Mereside, Alderley Park, Macclesfield, Cheshire SK10 4TG



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## INTERNATIONAL TRADING COMPUTER OPERATOR

City

c.£6,500

Our client is a subsidiary of a leading international trading group marketing an extensive range of commodities worldwide.

Major new development plans are underway, with mini computers currently in use, and the introduction of an IBM mainframe in 1984.

Our client offers a young ambitious operator, with up to a year's experience, an excellent opportunity to develop a long-term career in an international environment. A good benefits package is also offered. To apply, please telephone immediately, quoting ref: SA/1207.

Sue Armstrong,  
Key Operations Assistance Ltd,  
72 Dean Street, London W1.  
Tel: 01-439 7561.

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## COMPUTER PROGRAMMERS

The Equitable Life, a long established and expanding organisation, has vacancies for two Programmers who will join them in their modern air-conditioned offices close to the centre of Aylesbury.

Applicants, aged 20-26, should have at least 1½ years' commercial programming experience, using the COBOL language in an ICL environment.

The Society offers competitive salaries plus an annual bonus. Other benefits include a non-contributory pension scheme, 20 days' holiday a year, a staff restaurant providing free lunches, and the opportunity in the future to be considered for a staff house purchase loan at concessionary rates.

Please write or telephone, indicating briefly, how you meet our requirements, to:-

Mrs Carol Bird, Staff Assistant, The Equitable Life Assurance Society, Walton Street, Aylesbury, Bucks, HP21 7QW. Telephone: Aylesbury (0298) 33100.

The Equitable Life

### Senior Programmer

Salary £7,974-£8,508 inclusive (AP5) plus July Salary Award

Applicants should have a minimum of two years' programming experience in COBOL and should ideally have I.D.M.S. and/or VME experience.

This post offers the opportunity to participate in the development of a property database using both batch and online techniques. The postholder will also be expected to give consultancy to users and to undertake projects without supervision.

### Programmer

Salary £7,056-£7,728 inclusive (AP4) plus July Salary Award

Applicants should have a minimum of one year's experience of COBOL preferably in a VME environment. It is also desirable that he/she has experience of I.D.M.S. as the postholder will take part in the development of database projects.

For both posts where applicable training will be given. Benefits include:

- ★ Staff Productivity Scheme
- ★ Flexitime System
- ★ Housing accommodation if appropriate and/or Relocation expenses paid.

Job details and application forms are available from the Chief Financial Officer, Council Offices, The Campus, Welwyn Garden City, Herts AL8 6AE. Tel: WGC 31212 Ext. 325.

Closing date Friday, 15th July, 1983.

WELWYN HATFIELD  
DISTRICT COUNCIL

(4413)

# SYSTEMS & PROGRAMMING

## CONTRACT REQUIREMENTS

IBM MVS PL/1 & CICS - PROGRAMMER	- MID AUGUST	- LONDON
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IBM MVS - SYSTEMS PROGRAMMERS	- A.S.A.P.	- SURREY
IBM DOS/VSE PL/1 DL/1 - PROGRAMMER	- A.S.A.P.	- SURREY
IBM DOS/VSE PL/1 - PROGRAMMER	- A.S.A.P.	- SURREY
IBM SYSTEM 38 MAAPICS - PROGRAMMER	- A.S.A.P.	- S.W.
PDP RSX1M, DECNET - SYSTEMS PROGRAMMER	- A.S.A.P.	- SURREY
PDP SERIES 4, TPM - PROGRAMMER	- A.S.A.P.	- SURREY
VAX OR PDP FORTRAN - PROGRAMMER	- A.S.A.P.	- SOUTH COAST
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DATA GENERAL RDOOS ASSEMBLER & FORTRAN - PROGRAMMER	- A.S.A.P.	- BERKS
DATA GENERAL AOS FORTRAN - PROGRAMMER	- A.S.A.P.	- LONDON
DATA GENERAL RDOOS - BUSINESS ANALYST/PROGRAMMER	- A.S.A.P.	- BUCKS
BURROUGHS 6800, GEMCOS, DMSII COBOL - PROGRAMMERS	- A.S.A.P.	- W. LONDON
BURROUGHS CMS COBOL - PROGRAMMERS	- A.S.A.P.	- ALL AREAS
TANDEM GUARDIAN COBOL - DESIGNER/PROGRAMMER	- A.S.A.P.	- LONDON
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*IBM DOS/VSE COBOL, CICS, DL/1 - ANALYST/PROGRAMMERS	- KUWAIT	

Contact Heather, Lynne or Lorraine on 948-5922 or alternatively contact Lorraine on Walton-on-Thames (98) 45552 (Evenings/Weekends)

## PERMANENT

### ANALYST PROGRAMMERS - Paris

from £14,000

A major international consultancy, our client, has an immediate requirement for two French speaking COBOL IMS DL/1 Analyst Programmers. Based at the London office you will be expected to work on financial and commercial projects on client sites in and around Paris - with excellent support coming from the Paris office. You must have led at least one major project and have good database specification and design experience. Quote Ref. 8081/CW

### PROJECT LEADER PDP/VAX - South Coast

c. £13,000

A specialist life assurance company is currently looking for a Project Leader with a commercial/financial background. You will be responsible for ensuring that projects are completed to time and budget, and that users continue to receive the pre-requisite support. You should have seen at least two major projects through to implementation and be looking to grow into a middle-management role. There is a non-contributory pension scheme and a mortgage subsidy included in a very generous benefits package. Quote Ref. 8096/CW

### ANALYST PROGRAMMER SYSTIME - Surrey

to £11,000

A well known office equipment manufacturer is currently looking for a young Analyst/Programmer. The major projects will be the development of a sales order processing system. Future development projects will involve both fixed assets and manufacturing packages. Quote Ref. 8112

### ANALYST PROGRAMMER HP 3000 - Berks

to £10,000

A brand leader in its product area this company is now looking for an experienced Analyst/Programmer for their HP 3000. You will initially work on the development of financial systems, but will be expected to be personally involved in the sales and distribution project teams, over the first year. It's a small team, so personality will play an important part in your career development. Quote Ref. 8111/CW

We also require the following permanent staff for other clients:

IBM Cobol Programmers - MVS, VM/CMS to £10,000  
Graduate Analyst/Programmers IBM Cobol IMS/DL/1 to £9,500  
IBM Programmers VM/CMS, IMS, DB, DC, Kent to £12,300  
Snr. Programmer ME29 TME/MTS/IDMS Comms to £10,500  
Analyst Programmer IBM DOS/VSE-COBOL-CICS, Surrey to £13,000

Please contact DAVID or KEITH at KPG or on 01-747 0969 or 01-399 8163 during the evenings or weekends.

**KPG**  
01-948 5922

KPG Computer Support Services Limited  
Cobden House, Park Lane, Richmond, Surrey, TW9 2RA

